SONY

UHF SYNTHESIZED TUNER UNIT

WRR-855A

SERVICE MANUAL

U Model
AU Model

1st Edition (Revised 1)

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

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Owner's Record

The model and serial numbers are located at the rear of the unit. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. WRR-855A Serial No. _____

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Notice for customers in Canada:
Use of Sony wireless devices is regulated by the Industry Canada as described in their Radio Standard Specification RSS-123.
A licence is normally required. The local district office of Industry Canada should therefore be contacted. When the operation of the device is within the broadcast band, the licence is issued on no-interference, no-protection basis with respect to broadcast signals.

Avis pour les clients au Canada:
L'usage des appareils sans-fil Sony est réglé par l'Industrie Canada, comme décrit dans leur Cahier des Normes Radioélectriques CNR-123. Une licence est normalement requise. Le bureau de l'Industrie Canada doit être contacté. Lorsque l'opération de l'appareil est dans les limites de la bande de radiodiffusion, la licence est émanée sur la base de non-interférence, non-protection avec les signaux de radiodiffusion.

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Overview

The WRR-855A UHF Synthesized Tuner Unit in use with an optional Portable Tuner Mount Adapter, such as the BTA-801, provides a highly reliable portable diversity tuner for the 800 MHz band Sony UHF wireless microphone system, which uses the frequency bands allocated for UHF TV broadcasting.
This tuner enables the application of multiple channels over unused television channels through the use of the built-in Sony original channel plan.

Features

Phase Locked Loop (PLL) Synthesized System
The WRR-855A with its refined PLL synthesized circuit can operate on 94 wireless channels.

Preset wireless channel groups for easy multichannel operation
In addition to a group allowing all 94 wireless channels to be selected, the WRR-855A has six preprogrammed groups, that is, a combination of wireless channels which permits simultaneous operation of multiple channels without intermodulation.

Space diversity reception system
The WRR-855A provides stable signal reception with only a minute amount of dropout.

Versatile display
A variety of information is obtained at a glance on the upper panel, such as the reception channel with the liquid-crystal display, and RF input level and audio level with the respective LEDs.

Compact and lightweight
Innovative, high-density mounting technology has enabled the creation of this compact, lightweight tuner. Using the optional BTA-801 Portable Tuner Mount Adapter in combination, the WRR-855A can be easily attached to a Betacam-series Camcorder.

Weatherproof structure
By properly mounting the WRR-855A to the optional BTA-801 Portable Tuner Mount Adapter and attaching the two supplied antennas, a weatherproof structure is obtained.

Muting ON/OFF function
You can activate or deactivate the muting function to suit your needs.

Tone-squelch circuit for noise elimination
The unit uses a built-in squelch circuit to selectively receive the desired RF carrier accompanied by the tone signal from the transmitter.

Compander system
A compander (compressor/expander) system enables stabilized wireless transmission over a wide dynamic range.

System Configuration

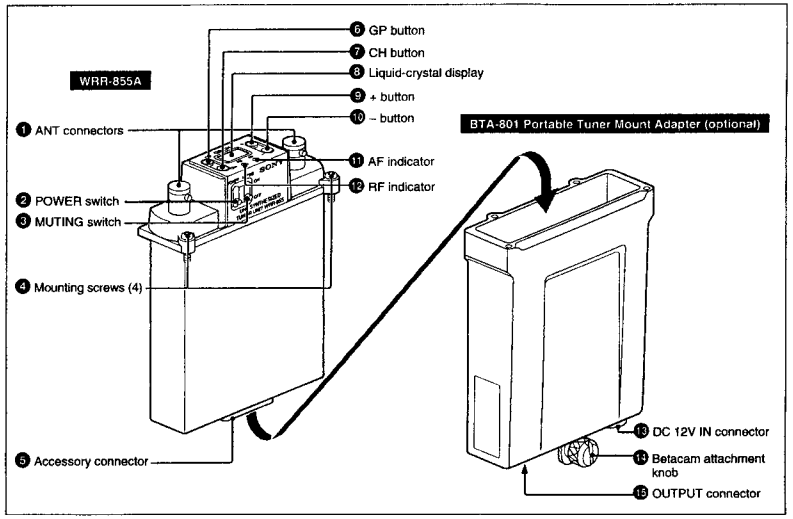
The WRR-855A can be used with the WRT-807A/810A/830A/867A UHF synthesized wireless microphone or WRT-808A/820A/822A/860A UHF synthesized transmitter.

Sony 800 MHz band system models

Frequency band			Model name	
Model	TV channel	Frequency (MHz)	Transmitter or microphone	Tuner
U64	64	770.125 - 775.875	WRT-807A	
	65	776.125 - 781.875	WRT-808A	**WRR-855A**
U66	66	782.125 - 787.875	WRT-810A	WRR-810A
	67	788.125 - 793.875	WRT-820A	WRR-820A b)
U68	68	794.125 - 799.875	WRT-822A	WRR-840A b)
	69	800.125 - 805.875	WRT-830A a)	WRR-850A b)
			WRT-860A a)	WRR-860A a)
			WRT-867A a)	

a) These models cover only 68 and 69 channels.
b) For these models, the AN-820A UHF antenna and the WD-820A UHF antenna divider are required.

Parts Identification



This section is extracted from operation manual.

Section 1
Operation

For US model

Parts Identification

WRR-855A

❶ ANT (antenna) connectors
Connect the two supplied antennas to these connectors.

❷ POWER switch
Turns the power ON/OFF.

❸ MUTING switch
Turns the muting ON/OFF. The muting level is fixed at 10 dBμ.

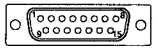
Note

If you turn off the muting when the tuner is in standby condition for signal receiving or when the RF input level is low, noise may be heard or the connected device or speakers may be damaged. Be sure to operate this switch only after minimizing the input of the connected device.

❹ Mounting screws
Used to secure the WRR-855A to the BTA-801.
For mounting, see "Mounting to a Portable Tuner Mount Adapter" on page 8.

❺ Accessory connector
For the signal and power connections with the BTA-801.

Pin assignment



1: AF GND
2: AF OUTPUT
4: DC +7V
5: GND

❻ GP (group set) button
Press and hold down for at least one second to go to the group selection mode, and the group number flashes on the display.
See "Setting" on page 10.

❼ CH (channel set) button
Press and hold down for at least one second to go to the channel selection mode and the channel number flashes on the display.
See "Setting" on page 10.

❽ Liquid-crystal display
When you turn the power ON, the "HELLO" message appears, then the tuner unit goes to normal display mode.

❾ + button / ❿ – button
Press to select the group and channel numbers to be received.
See "Setting" on page 10.

⓫ AF (audio frequency level) indicator
Lights when an audio signal greater than the reference level is output.

⓬ RF (radio frequency input level) indicator
Displays the strength of the input signal.
Lights in green: Higher than 25 dBμ
Lights in red: 10 to 25 dBμ
Goes off: Lower than 10 dBμ

BTA-801 Portable Tuner Mount Adapter (Optional)

⓭ DC 12V IN (power input) connector
Connect to an external power supply (DC 10 to 17 V) of a Betacam using the DC power cable supplied with the BTA-801.

Pin assignment

1: GND
2: NC
3: NC
4: +12 V

Note

Be sure to check the operating voltage and polarity when connecting to a power source.

⓮ Betacam attachment knob
Used to fix the unit to a Betacam.
For attaching the unit to a Betacam, see page 24.

⓯ OUTPUT connector (XLR 3-pin, male)
Supplies audio signals. You can connect this to the microphone input connector of a Betacam, mixer, tape recorder or other similar equipment.

Pin assignment

1: GND
2: HOT
3: COLD

Note

When connecting to an audio mixer which has a Phantom powering capability for microphones, it is recommended to use the mixer with the Phantom power OFF.

Preparations

Mounting to a Portable Tuner Mount Adapter

This section shows you how to moung the WRR-855A to the BTA-801 Portable Tuner Mount Adapter for example. By properly mounting the WRR-855A to the BTA-801 and attaching the two supplied antennas, a weatherproof structure is obtained.

Before mounting

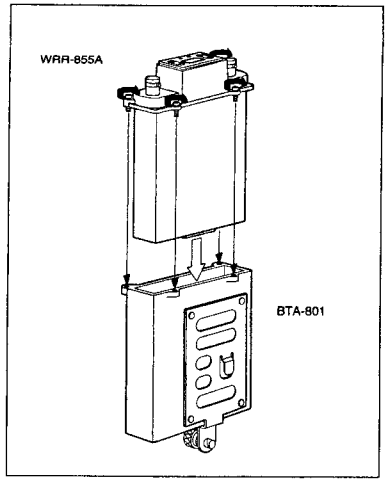
Be sure to clean the abutting surfaces of the WRR-855A and the BTA-801 before mounting.

Procedure to mount to the BTA-801

1 Observing the direction, insert the WRR-855A in the BTA-801.

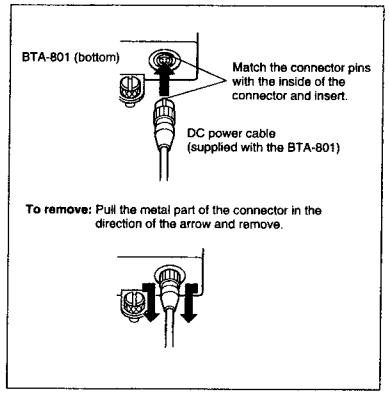
2 Push the WRR-855A until the accessory connector clicks into place.

3 Run in the four mounting screws little by little in turn to gradually secure the units together, then tighten them.



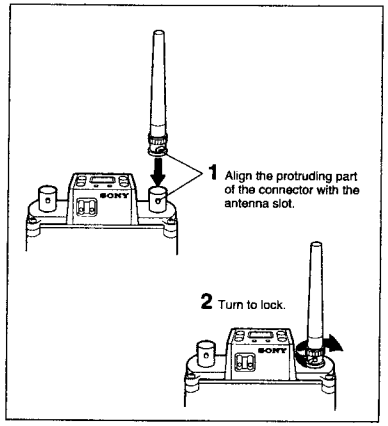
Connecting the Power Cable

Connect the DC 12 V IN connector of the BTA-801 to the DC OUT connector of a Betacam-series Camcorder using the DC power cable supplied with the BTA-801.


BTA-801 (bottom)
Match the connector pins with the inside of the connector and insert.
DC power cable (supplied with the BTA-801)
To remove: Pull the metal part of the connector in the direction of the arrow and remove.

Attaching the Antennas

Attach the supplied antennas to the two ANT connectors.



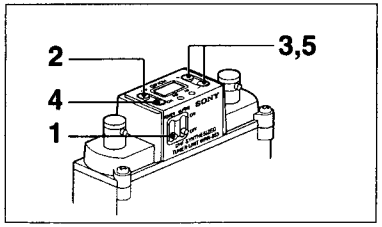
Setting

Channel Selection

Notes

Take the following precautions to prevent interference and noise.

- Do not simultaneously use two or more microphones and transmitters that are set to the same channel.
- When simultaneously using two or more tuners, always set the tuners that use the same groups (other than group 00) to different channels in that group.
- The reception antennas and transmitter should be used at least 3 meters away from each other.



Operations

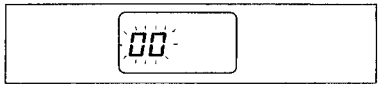
Operations

1 Turn the POWER switch ON.
After the "HELLO" message, the tuner status shown before the tuner was previously turned OFF appears on the display.

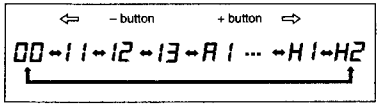
Note

POWER switch operation should be performed after disconnecting the input from connected equipment, as noise will be heard if the switch is turned ON or OFF beforehand.

2 Press and hold the GP button down for more than one second.
The tuner goes to the group selection mode and the group number flashes.

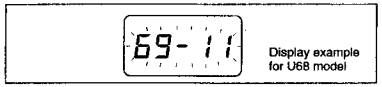


3 Press the + or – button to select the group.
Pressing the + button cyclically changes the groups in the order of 00 to 11 to 12 to 13 to A1 to A2 to A3 to L1 to L2 to H1 to H2 and pressing the – button changes them in the reverse order.
Press and hold down the button to continuously change the display.

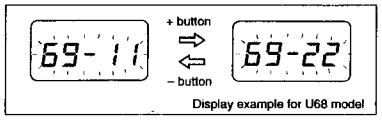


If no buttons are pressed for 5 seconds, the group selection mode is automatically canceled and the lowest frequency channel in the group selected at that time is displayed.
For Group 00, however, the channel previously set in Group 00 appears.

4 Press the CH button when the desired group is displayed.
The tuner goes to the channel selection mode and the channel number flashes.



5 Press the + or – button to select the channel.
Pressing the + button cyclically changes the channels of the group selected in step 3 in the listed order in the respective table in the "Wireless Channel Lists" on pages 15 to 23. Pressing the – button changes them in the reverse order.



When you reach the last channel in the group, press the + button to return to the first channel in the group.
Likewise, press the – button to go from the first channel to the last channel.
When the group is set to 00, press either of these buttons to move through the 94 channels one by one.

(Continued)

6 After the desired channel is displayed, leave the unit for 5 seconds without pressing any buttons.
Channel selection mode is automatically canceled and the channel (or frequency) shown on the display is set.

Storing the group and channel

The selected group and channel set by the above procedure are stored in memory when the display stops flashing.

Distortion-check function

Before operating a wireless microphone or transmitter, you can check for possible distortion by using the distortion-check function of this unit. To check the distortion, simultaneously press the + and – buttons in the channel selection mode (the channel number flashes). The channels of the selected group are automatically switched one by one in sequence (this operation is called "scanning").

Notes

- When the MUNING switch is ON and the unit is not in the T OFF mode (see page 13), scanning stops and the channel at that time is selected if a tone signal (32.768 kHz) is detected in the signal received during scanning. However, scanning will not stop if a distorting signal having no tone signal is received.
  In this case, check for the distortion by observing the RF input level indicator.
- Scanning is automatically canceled when all the channels of the selected group are scanned twice. To cancel scanning in progress, press any of the operation buttons.
- If an extremely strong signal is received, scanning may stop at a point other than the actual channel.

Setting and Releasing the T (Tone Squelch) OFF Mode

The WRR-855A has the following three muting functions, which work in combination.

(1) Muting by RF input level: As sufficient S/N for the audio output may not be obtained if no RF signal is received or the RF input level is low, the audio output can be muted when the RF input level falls below the selected level.
(2) Tone squelch: The audio output is obtained only when the tuner receives an RF signal which includes a specified tone signal. The audio output is muted to eliminate noise which may be heard when the transmitter is turned on/off or the tuner receives an interference RF signal.
(3) Noise squelch: The audio output is muted to eliminate noise which may be heard when there is such excessive interference RF signal that the tone squelch does not work.

Only the muting functions described in (2) can be canceled by selecting the Tone-squelch OFF (T OFF) mode when desired. Apply this mode when you use a transmitter with no specified tone signal.

Selecting the T OFF mode

Turn the power ON while pressing and holding the GP and – buttons. Release the buttons after the "HELLO" message appears. "T OFF" is momentarily displayed and the tuner goes to the T OFF mode.
The T OFF mode is maintained even when the power is turned OFF.

Resuming from the T OFF mode

To cancel the T OFF mode, turn the power ON while pressing and holding the GP and + buttons, and release the buttons after "HELLO" appears on the display.
"T ON" is momentarily displayed and the tuner resumes the normal status.

Wireless Channels Selectable

Guidance on Use of Multi-Channel System

This product is designed to give excellent interference free operation in multi-channel systems. To maintain this, Sony recommends that one of the original Sony groups, number 00, 11, 12, 13, A1, A2, A3, L1, L2, H1 or H2 is selected. These groups will offer excellent performance, free from mutual interference from other Sony wireless microphone transmitters in the selected group when used under the recommended operating conditions. The remaining groups are included for compliance with frequency regulations in various countries, and will not always guarantee interference free operation.
Group 00 is used to scan for open channels, or to use only for a one channel system.

Each "wireless channel" is represented on the unit by a 2-digit TV channel number and another 2-digit number, for example: 68-23.

Notes

To eliminate interference or noise, please note the following.

- Do not use two or more wireless microphones or transmitters whose wireless channels are the same.
- If there is a TV broadcasting station nearby, to avoid possible interference from its broadcast, do not use that station's channel.
- The number of wireless channels actually usable in a multi-channel system may be smaller than the normal capacity of that system if there is interference from TV broadcasting or other RF signals.
- To operate two or more UHF synthesized wireless microphones/transmitters using the same wireless channel of the same group, ensure that the wireless microphones/transmitters are at least 100 m (330 feet)[1] apart as far as they are installed within sight of each other.
- When using two or more WRR-855As, do not directly put one unit upon the other.

1) The distance depends on the operating environment and conditions.

Wireless Channels Selectable

Group 11: 11-channel group
Use when both TV channels 68 and 69 are open.

Channel	Frequency (MHz)
68-05	794.625
68-14	795.750
68-25	797.125
68-41	799.125
68-47	799.875
69-12	801.500
69-16	802.000
69-30	803.750
69-37	804.625
69-40	805.000
69-42	805.250

Group 12: 8-channel group
Use when TV channel 69 is open.

Channel	Frequency (MHz)
69-01	800.125
69-05	800.625
69-11	801.375
69-25	803.125
69-28	803.500
69-36	804.500
69-41	805.125
69-43	805.375

Group 13: 8-channel group
Use when TV channel 68 is open.

Channel	Frequency (MHz)
68-03	794.375
68-13	795.625
68-18	796.250
68-26	797.250
68-37	798.625
68-40	799.000
68-44	799.500
68-46	799.750

Group A1: 19-channel group
The channels listed as Group A1 for the 66- and 64-version models can be simultaneouly used in combination.
See "Group A1" on pages 19 and 22.

Channel	Frequency (MHz)
68-06	794.750
68-20	796.500
68-24	797.000
68-40	799.000
69-04	800.500
69-17	802.125
69-23	802.875
69-47	805.875

Group A2: 13-channel group
The channels listed as Group A2 for the 66- and 64-version models can be simultaneouly used in combination.
See "Group A2" on pages 19 and 22.

Channel	Frequency (MHz)
69-11	801.375
69-22	802.750
69-30	803.750
69-36	804.500
69-40	805.000
69-43	805.375
69-45	805.625

Group A3: 13-channel group
The channels listed as Group A3 for the 66- and 64-version models can be simultaneouly used in combination.
See "Group A3" on pages 19 and 22.

Channel	Frequency (MHz)
68-10	795.250
68-21	796.625
68-29	797.625
68-35	798.375
68-39	798.875
68-42	799.250
68-44	799.500

Wireless Channel Lists (1) – For 68-Version Model Using TV Channels 68 and 69

Group 00: All channel access
Use to scan for open channels. Use only for a one channel system.

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
68-01	794.125	68-25	797.125	69-01	800.125	69-25	803.125
68-02	794.250	68-26	797.250	69-02	800.250	69-26	803.250
68-03	794.375	68-27	797.375	69-03	800.375	69-27	803.375
68-04	794.500	68-28	797.500	69-04	800.500	69-28	803.500
68-05	794.625	68-29	797.625	69-05	800.625	69-29	803.625
68-06	794.750	**68-30**	**797.750**	69-06	800.750	**69-30**	**803.750**
68-07	794.875	68-31	797.875	69-07	800.875	69-31	803.875
68-08	795.000	68-32	798.000	69-08	801.000	69-32	804.000
68-09	795.125	68-33	798.125	69-09	801.125	69-33	804.125
68-10	**795.250**	68-34	798.250	**69-10**	**801.250**	69-34	804.250
68-11	795.375	68-35	798.375	69-11	801.375	69-35	804.375
68-12	795.500	68-36	798.500	69-12	801.500	69-36	804.500
68-13	795.625	68-37	798.625	69-13	801.625	69-37	804.625
68-14	795.750	68-38	798.750	69-14	801.750	69-38	804.750
68-15	795.875	68-39	798.875	69-15	801.875	69-39	804.875
68-16	796.000	**68-40**	**799.000**	69-16	802.000	**69-40**	**805.000**
68-17	796.125	68-41	799.125	69-17	802.125	69-41	805.125
68-18	796.250	68-42	799.250	69-18	802.250	69-42	805.250
68-19	796.375	68-43	799.375	69-19	802.375	69-43	805.375
68-20	**796.500**	68-44	799.500	**69-20**	**802.500**	69-44	805.500
68-21	796.625	68-45	799.625	69-21	802.625	69-45	805.625
68-22	796.750	68-46	799.750	69-22	802.750	69-46	805.750
68-23	796.875	68-47	799.875	69-23	802.875	69-47	805.875
68-24	797.000			69-24	803.000		

Group L1: 7-channel group
Use when TV channel 68 is open.

Channel	Frequency (MHz)
68-09	795.125
68-11	795.375
68-19	796.375
68-25	797.125
68-30	797.750
68-34	798.250
68-37	798.625

Group L2: 7-channel group
Use when TV channel 68 is open.

Channel	Frequency (MHz)
68-10	795.250
68-13	795.625
68-17	796.125
68-22	796.750
68-28	797.500
68-36	798.500
68-38	798.750

Group H1: 7-channel group
Use when TV channel 69 is open.

Channel	Frequency (MHz)
69-09	801.125
69-11	801.375
69-19	802.375
69-25	803.125
69-30	803.750
69-34	804.250
69-37	804.625

Group H2: 7-channel group
Use when TV channel 69 is open.

Channel	Frequency (MHz)
69-10	801.250
69-13	801.625
69-17	802.125
69-22	802.750
69-28	803.500
69-36	804.500
69-38	804.750

Wireless Channels Selectable

Wireless Channel Lists (2) – For 66-Version Model Using TV Channels 66 and 67

Group 00: All channel access
Use to scan for open channels. Use only for a one channel system.

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
66-01	782.125	66-25	785.125	67-01	788.125	67-25	791.125
66-02	782.250	66-26	785.250	67-02	788.250	67-26	791.250
66-03	782.375	66-27	785.375	67-03	788.375	67-27	791.375
66-04	782.500	66-28	785.500	67-04	788.500	67-28	791.500
66-05	782.625	66-29	785.625	67-05	788.625	67-29	791.625
66-06	782.750	**66-30**	**785.750**	67-06	788.750	**67-30**	**791.750**
66-07	782.875	66-31	785.875	67-07	788.875	67-31	791.875
66-08	783.000	66-32	786.000	67-08	789.000	67-32	792.000
66-09	783.125	66-33	786.125	67-09	789.125	67-33	792.125
66-10	**783.250**	66-34	786.250	**67-10**	**789.250**	67-34	792.250
66-11	783.375	66-35	786.375	67-11	789.375	67-35	792.375
66-12	783.500	66-36	786.500	67-12	789.500	67-36	792.500
66-13	783.625	66-37	786.625	67-13	789.625	67-37	792.625
66-14	783.750	66-38	786.750	67-14	789.750	67-38	792.750
66-15	783.875	66-39	786.875	67-15	789.875	67-39	792.875
66-16	784.000	**66-40**	**787.000**	67-16	790.000	**67-40**	**793.000**
66-17	784.125	66-41	787.125	67-17	790.125	67-41	793.125
66-18	784.250	66-42	787.250	67-18	790.250	67-42	793.250
66-19	784.375	66-43	787.375	67-19	790.375	67-43	793.375
66-20	**784.500**	66-44	787.500	**67-20**	**790.500**	67-44	793.500
66-21	784.625	66-45	787.625	67-21	790.625	67-45	793.625
66-22	784.750	66-46	787.750	67-22	790.750	67-46	793.750
66-23	784.875	66-47	787.875	67-23	790.875	67-47	793.875
66-24	785.000			67-24	791.000		

Group L1: 7-channel group
Use when TV channel 66 is open.

Channel	Frequency (MHz)
66-09	783.125
66-11	783.375
66-19	784.375
66-25	785.125
66-30	785.750
66-34	786.250
66-37	786.625

Group L2: 7-channel group
Use when TV channel 66 is open.

Channel	Frequency (MHz)
66-10	783.250
66-13	783.625
66-17	784.125
66-22	784.750
66-28	785.500
66-36	786.500
66-38	786.750

Group H1: 7-channel group
Use when TV channel 67 is open.

Channel	Frequency (MHz)
67-09	789.125
67-11	789.375
67-19	790.375
67-25	791.125
67-30	791.750
67-34	792.250
67-37	792.625

Group H2: 7-channel group
Use when TV channel 67 is open.

Channel	Frequency (MHz)
67-10	789.250
67-13	789.625
67-17	790.125
67-22	790.750
67-28	791.500
67-36	792.500
67-38	792.750

Group 11: 11-channel group
Use when both TV channels 66 and 67 are open.

Channel	Frequency (MHz)
66-05	782.625
66-14	783.750
66-25	785.125
66-41	787.125
66-47	787.875
67-12	789.500
67-16	790.000
67-30	791.750
67-37	792.625
67-40	793.000
67-42	793.250

Group 12: 8-channel group
Use when TV channel 67 is open.

Channel	Frequency (MHz)
67-01	788.125
67-05	788.625
67-11	789.375
67-25	791.125
67-28	791.500
67-36	792.500
67-41	793.125
67-43	793.375

Group 13: 8-channel group
Use when TV channel 66 is open.

Channel	Frequency (MHz)
66-03	782.375
66-13	783.625
66-18	784.250
66-26	785.250
66-37	786.625
66-40	787.000
66-44	787.500
66-46	787.750

Group A1: 19-channel group
The channels listed as Group A1 for the 64- and 68-version models can be simultaneouly used in combination.
See "Group A1" on pages 16 and 22.

Channel	Frequency (MHz)
66-02	782.250
66-24	785.000
66-29	785.625
67-16	790.000
67-18	790.250
67-39	792.875

Group A2: 13-channel group
The channels listed as Group A2 for the 64- and 68-version models can be simultaneouly used in combination.
See "Group A2" on pages 16 and 22.

Channel	Frequency (MHz)
67-07	788.875
67-33	792.125
67-45	793.625

Group A3: 13-channel group
The channels listed as Group A3 for the 64- and 68-version models can be simultaneouly used in combination.
See "Group A3" on pages 16 and 22.

Channel	Frequency (MHz)
66-06	782.750
66-32	786.000
66-44	787.500

Wireless Channel Lists (3) – For 64-Version Model Using TV Channels 64 and 65

Group 00: All channel access
Use to scan for open channels. Use only for a one channel system.

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
64-01	770.125	64-25	773.125	65-01	776.125	65-25	779.125
64-02	770.250	64-26	773.250	65-02	776.250	65-26	779.250
64-03	770.375	64-27	773.375	65-03	776.375	65-27	779.375
64-04	770.500	64-28	773.500	65-04	776.500	65-28	779.500
64-05	770.625	64-29	773.625	65-05	776.625	65-29	779.625
64-06	770.750	**64-30**	**773.750**	65-06	776.750	**65-30**	**779.750**
64-07	770.875	64-31	773.875	65-07	776.875	65-31	779.875
64-08	771.000	64-32	774.000	65-08	777.000	65-32	780.000
64-09	771.125	64-33	774.125	65-09	777.125	65-33	780.125
64-10	**771.250**	64-34	774.250	**65-10**	**777.250**	65-34	780.250
64-11	771.375	64-35	774.375	65-11	777.375	65-35	780.375
64-12	771.500	64-36	774.500	65-12	777.500	65-36	780.500
64-13	771.625	64-37	774.625	65-13	777.625	65-37	780.625
64-14	771.750	64-38	774.750	65-14	777.750	65-38	780.750
64-15	771.875	64-39	774.875	65-15	777.875	65-39	780.875
64-16	772.000	**64-40**	**775.000**	65-16	778.000	**65-40**	**781.000**
64-17	772.125	64-41	775.125	65-17	778.125	65-41	781.125
64-18	772.250	64-42	775.250	65-18	778.250	65-42	781.250
64-19	772.375	64-43	775.375	65-19	778.375	65-43	781.375
64-20	**772.500**	64-44	775.500	**65-20**	**778.500**	65-44	781.500
64-21	772.625	64-45	775.625	65-21	778.625	65-45	781.625
64-22	772.750	64-46	775.750	65-22	778.750	65-46	781.750
64-23	772.875	64-47	775.875	65-23	778.875	65-47	781.875
64-24	773.000			65-24	779.000		

Wireless Channels Selectable

Group 11: 11-channel group
Use when both TV channels 64 and 65 are open.

Channel	Frequency (MHz)
64-05	770.625
64-14	771.750
64-25	773.125
64-41	775.125
64-47	775.875
65-12	777.500
65-16	778.000
65-30	779.750
65-37	780.625
65-40	781.000
65-42	781.250

Group 12: 8-channel group
Use when TV channel 65 is open.

Channel	Frequency (MHz)
65-01	776.125
65-05	776.625
65-11	777.375
65-25	779.125
65-28	779.500
65-36	780.500
65-41	781.125
65-43	781.375

Group 13: 8-channel group
Use when TV channel 64 is open.

Channel	Frequency (MHz)
64-03	770.375
64-13	771.625
64-18	772.250
64-26	773.250
64-37	774.625
64-40	775.000
64-44	775.500
64-46	775.750

Group A1: 19-channel group
It is possible to obtain a 19-channel intermodulation-free combination when the three versions of the tuner are set to Group A1. The channels listed as Group A1 for the 66- and 68-version models can be used in combination.
See "Group A1" on pages 16 and 19.

Channel	Frequency (MHz)
64-05	770.625
64-12	771.500
64-15	771.875
65-24	779.000
65-33	780.125

Group A2: 13-channel group
To simultaneously use up to 13 channels selected in the frequency band of odd-numbered TV channels of those receivable by the three versions of the tuner. The channels listed as Group A2 for the 66- and 68-version models can be used in combination.
See "Group A2" on pages 16 and 19.

Channel	Frequency (MHz)
65-02	776.250
65-19	778.375
65-43	781.375

Group A3: 13-channel group
To simultaneously use up to 13 channels selected in the frequency band of even-numbered TV channels of those receivable by the three versions of the tuner. The channels listed as Group A3 for the 66- and 68-version models can be used in combination.
See "Group A3" on pages 16 and 19.

Channel	Frequency (MHz)
64-01	770.125
64-18	772.250
64-42	775.250

Group L1: 7-channel group
Use when TV channel 64 is open.

Channel	Frequency (MHz)
64-09	771.125
64-11	771.375
64-19	772.375
64-25	773.125
64-30	773.750
64-34	774.250
64-37	774.625

Group L2: 7-channel group
Use when TV channel 64 is open.

Channel	Frequency (MHz)
64-10	771.250
64-13	771.625
64-17	772.125
64-22	772.750
64-28	773.500
64-36	774.500
64-38	774.750

Group H1: 7-channel group
Use when TV channel 65 is open.

Channel	Frequency (MHz)
65-09	777.125
65-11	777.375
65-19	778.375
65-25	779.125
65-30	779.750
65-34	780.250
65-37	780.625

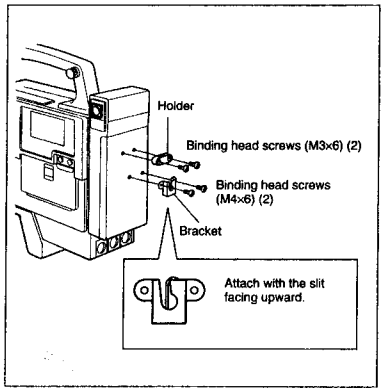
Group H2: 7-channel group
Use when TV channel 65 is open.

Channel	Frequency (MHz)
65-10	777.250
65-13	777.625
65-17	778.125
65-22	778.750
65-28	779.500
65-36	780.500
65-38	780.750

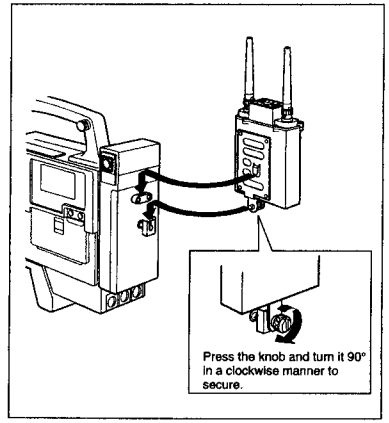
Attaching and Connecting to a Betacam

Use the Betacam attachment kit supplied with the BTA-801 Portable Tuner Mount Adapter.

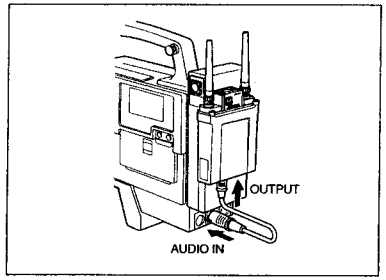
1 Attach the holder and bracket to the Betacam.



2 Align the attachment plate of the back of the BTA-801 with the holder and bracket.



3 Connect the output cable (optional).

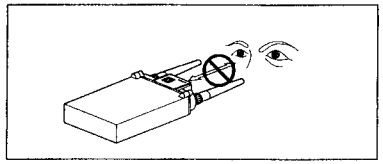


4 Connect the DC power cable supplied with the BTA-801.
For the power cable connection, see page 9.

Precautions

On operation

- The tuner unit must be used within the temperature range of 0°C to 50°C (32°F to 122°F). Avoid using for an extended period time in extremely high temperature, or the place subject to direct sunlight, especially outdoors, because the finish of the case might be damaged. Never install the tuner on or near heat sources, such as lighting equipment, power amplifiers.
- The tuner is designed to be portable and is built to resist humidity and dust. However, try to avoid using in very humid or dusty places, because such use may shorten the life of the tuner unit.
- To avoid degradation of the signal-to-noise ratio, do not use the tuner in noisy places or in locations subject to vibration, for example:
  - near electric equipment such as motors, transformers or dimmers
  - near air conditioning equipment or places subject to direct air flow from an air conditioner
  - near a public address loudspeaker
  - in a location where adjacent equipment might knock against the tuner.
- The switching of lights may produce electrical interference over the entire frequency range. Position the tuner and the wireless microphone in a place where such interference is at minimum.
- The tuner unit is precisely adjusted at the factory and no adjustment before use is necessary. Do not touch the inside of the unit or try to repair it by yourself.
- When looking into the upper-panel displays, be careful to keep a sufficient distance between your eyes and the tuner unit.



On cleaning

Clean the tuner unit with a dry, soft cloth. Never use thinner or benzine, since these will damage the finish.

Messages on the Display

In addition to the normal indications, the following messages may appear on the liquid-crystal display.

Messages	Contents	Measures
Err 01	An error occurred in backup memory data.	The data was initialized. Perform the receiving group/ channel selection and muting setting again.
Err 02	The PLL synthesized circuit is in trouble.	Contact your Sony dealer.
Err 03	The operating voltage exceeds the allowable value.	Contact your Sony dealer.
TONE	As no tone signal is available or a tone signal other than 32.768 kHz is being received, the audio signal output is being muted.	Set the tuner to the T OFF mode (see page 13) to output the audio signal.
T OFF a)	The tuner is set in T OFF mode.	For details, see "Selecting and Releasing the T (Tone Squelch) OFF Mode" on page13.

a) This message appears after "HELLO" message when the tuner is turned on. Subsequently, the tuner goes to the normal display status.

Specifications

Tuner section

Type of reception	110KF3E
Circuit system	Dual conversion superheterodyne
Receiving frequencies	
U64 model:	770.125 to 781.875 MHz (TV channels 64 and 65)
U66 model:	782.125 to 793.875 MHz (TV channels 66 and 67)
U68 model:	794.125 to 805.875 MHz (TV channels 68 and 69)
Local oscillators	1st: Crystal controlled PLL synthesizer 2nd: Crystal oscillator
Reference deviation	±5.0 kHz
Selectivity	60 dB or more (at ±250 kHz detuned)
Surplus distortion ratio	80 dB or more
Image distortion ratio	80 dB or more
Muting level	10 dBμ (ON/OFF possible)
Antenna connectors	BNC-R type (2), 50 ohms
Frequency response	50 to 15,000 Hz ±3.0 dB
De-emphasis	50 μsec
Signal-to-noise ratio	(±5.0 kHz deviation at 1 kHz modulation) 30 dB or more at RF input level 10 dBμ (A-weighted) 60 dB or more at RF input level 60 dBμ (A-weighted)
Distortion	1.0% or less (±40 kHz deviation at 1 kHz modulation)
Tone signal frequency	32.768 kHz
Output level	–40 dBu (0 dBu=0.775 Vrms, ±5.0 kHz deviation at 1 kHz modulation)
Output impedance	25 ohms, unbalanced
Output connector	15-pin D-sub connector (1)

General

Power requirements	DC 7 V (when using the BTA-801)
Operating voltage	DC 6.5 to 9.0 V
Current consumption	200 mA DC or less (at DC 7 V)
Operating temperature	0°C to +50°C (32°F to 122°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Dimensions	88 × 118.8 × 31.3 mm (w/h/d) ($3^1/_2 \times 4^3/_4 \times 1^1/_4$ inches)
Mass	Approx. 280 g (9.9 oz) with the supplied antennas attached
Supplied accessories	Antennas (2) Operating instructions (1)

Optional accessories

Portable Tuner Mount Adapter: BTA-801
Microphone cable (for Audio output cable):
EC-0.5C2-F (XLR-3-11C type ↔ XLR-3-11C type)
EC-0.5C2 (XLR-3-11C type ↔ XLR-3-12C type)

Design and specifications are subject to change without notice.

0 dBμ = 1 μV

Sony Corporation Printed in Japan

For US model

Owner's Record

The model and serial numbers are located at the rear of the unit. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. WRR-855A Serial No. _____

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Overview

The WRR-855A UHF Synthesized Tuner Unit in use with an optional Portable Tuner Mount Adapter, such as the BTA-801, provides a highly reliable portable diversity tuner for the 800 MHz band Sony UHF wireless microphone system, which uses the frequency bands allocated for UHF TV broadcasting.
This tuner enables the application of multiple channels over unused television channels through the use of the built-in Sony original channel plan.

Features

Phase Locked Loop (PLL) Synthesized System
The WRR-855A with its refined PLL synthesized circuit can operate on 102 wireless channels.

Preset wireless channel groups for easy multichannel operation
In addition to a group allowing all 102 wireless channels to be selected, the WRR-855A has six preprogrammed groups, that is, a combination of wireless channels which permits simultaneous operation of multiple channels without intermodulation.

Space diversity reception system
The WRR-855A provides stable signal reception with only a minute amount of dropout.

Versatile display
A variety of information is obtained at a glance on the upper panel, such as the reception channel with the liquid-crystal display, and RF input level and audio level with the respective LEDs.

Compact and lightweight
Innovative, high-density mounting technology has enabled the creation of this compact, lightweight tuner. Using the optional BTA-801 Portable Tuner Mount Adapter in combination, the WRR-855A can be easily attached to a Betacam-series Camcorder.

Weatherproof structure
By properly mounting the WRR-855A to the optional BTA-801 Portable Tuner Mount Adapter and attaching the two supplied antennas, a weatherproof structure is obtained.

Muting ON/OFF function
You can activate or deactivate the muting function to suit your needs.

Tone-squelch circuit for noise elimination
The unit uses a built-in squelch circuit to selectively receive the desired RF carrier accompanied by the tone signal from the transmitter.

Compander system
A compander (compressor/expander) system enables stabilized wireless transmission over a wide dynamic range.

SystemConfiguration

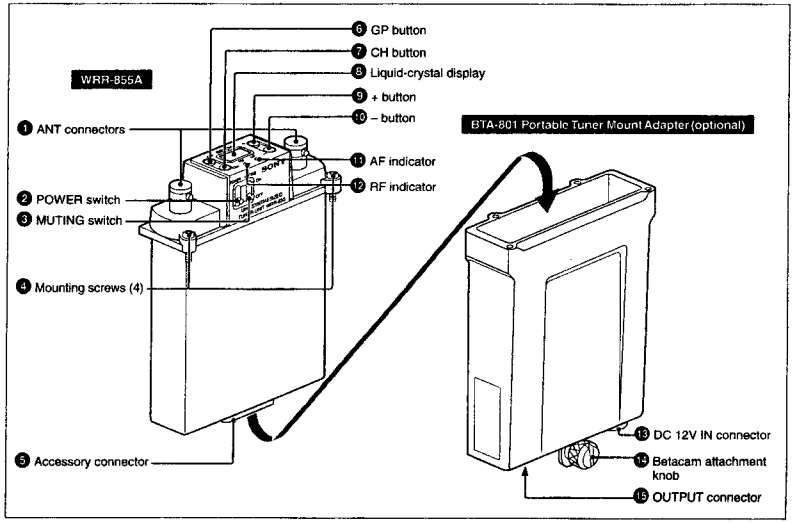
The WRR-855A can be used with the WRT-810A/830A/867A UHF synthesized wireless microphone or WRT-820A/860A UHF synthesized transmitter.

Sony 800 MHz band system models

Frequency band		Model name	
TV channel	Frequency (MHz)	Transmitter or microphone	Tuner
66	792.250 - 798.500	WRT-810A(66) WRT-820A(66) WRT-830A(66) WRT-860A(66) WRT-867A(66)	WRR-810A(66) WRR-840A(66) a) **WRR-855A(66)** WRR-860A(66)
67	799.250 - 805.500		

a) For this model, the AN-820A UHF antenna is required. Use the WD-820A UHF antenna divider as well when required.

PartsIdentification



Parts Identification

WRR-855A

❶ ANT (antenna) connectors
Connect the two supplied antennas to these connectors.

❷ POWER switch
Turns the power ON/OFF.

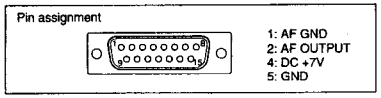
❸ MUTING switch
Turns the muting ON/OFF. The muting level is fixed at 10 dBμ.

Note

If you turn off the muting when the tuner is in standby condition for signal receiving or when the RF input level is low, noise may be heard or the connected device or speakers may be damaged. Be sure to operate this switch only after minimizing the input of the connected device.

❹ Mountingscrews
Used to secure the WRR-855A to the BTA-801.
For mounting, see "Mounting to a Portable Tuner Mount Adapter" on page 8.

❺ Accessoryconnector
For the signal and power connections with the BTA-801.



❻ GP (group set) button
Press and hold down for at least one second to go to the group selection mode, and the group number flashes on the display.
See "Setting" on page 10.

❼ CH (channel set) button
Press and hold down for at least one second to go to the channel selection mode and the channel number flashes on the display.
See "Setting" on page 10.

❽ Liquid-crystaldisplay
When you turn the power ON, the "HELLO" message appears, then the tuner unit goes to normal display mode.

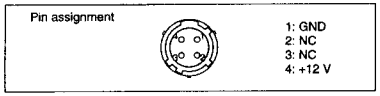
❾ + button / ❿ – button
Press to select the group and channel numbers to be received.
See "Setting" on page 10.

⓫ AF (audio frequency level) indicator
Lights when an audio signal greater than the reference level is output.

⓬ RF (radio frequency input level) indicator
Displays the strength of the input signal.
Lights in green: Higher than 25 dBμ
Lights in red: 10 to 25 dBμ
Goes off: Lower than 10 dBμ

BTA-801 Portable Tuner Mount Adapter (Optional)

⓭ DC 12V IN (power input) connector
Connect to an external power supply (DC 10 to 17 V) of a Betacam using the DC power cable supplied with the BTA-801.

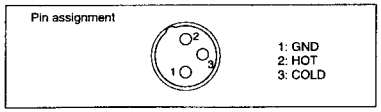


Note

Be sure to check the operating voltage and polarity when connecting to a power source.

⓮ Betacam attachment knob
Used to fix the unit to a Betacam.
For attaching the unit to a Betacam, see page 17.

⓯ OUTPUT connector (XLR 3-pin, male)
Supplies audio signals. You can connect this to the microphone input connector of a Betacam, mixer, tape recorder or other similar equipment.



Note

When connecting to an audio mixer which has a Phantom powering capability for microphones, it is recommended to use the mixer with the Phantom power OFF.

Preparations

Mounting to a Portable Tuner Mount Adapter

This section shows you how to moung the WRR-855A to the BTA-801 Portable Tuner Mount Adapter for example. By properly mounting the WRR-855A to the BTA-801 and attaching the two supplied antennas, a weatherproof structure is obtained.

Beforemounting

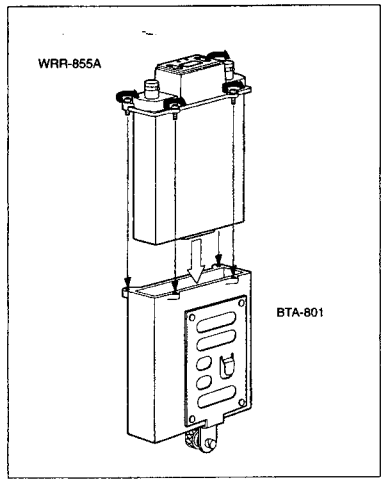
Be sure to clean the abutting surfaces of the WRR-855A and the BTA-801 before mounting.

Procedure to mount to the BTA-801

1 Observing the direction, insert the WRR-855A in the BTA-801.

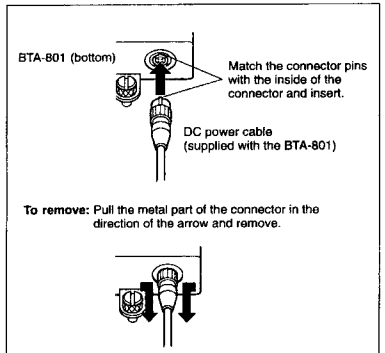
2 Push the WRR-855A until the accessory connector clicks into place.

3 Run in the four mounting screws little by little in turn to gradually secure the units together, then tighten them.



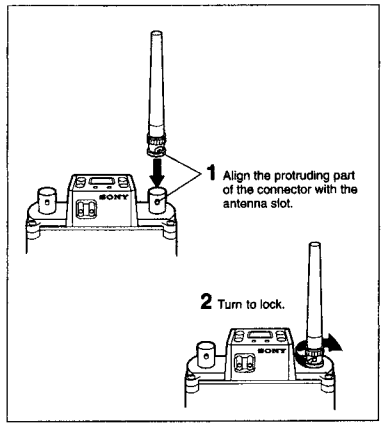
Connecting the Power Cable

Connect the DC 12 V IN connector of the BTA-801 to the DC OUT connector of a Betacam-series Camcorder using the DC power cable supplied with the BTA-801.


BTA-801 (bottom)
Match the connector pins with the inside of the connector and insert.
DC power cable (supplied with the BTA-801)
To remove: Pull the metal part of the connector in the direction of the arrow and remove.

Attaching the Antennas

Attach the supplied antennas to the two ANT connectors.



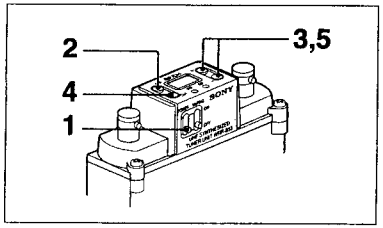
Setting

Channel Selection

Notes

Take the following precautions to prevent interference and noise.

- Do not simultaneously use two or more microphones and transmitters that are set to the same channel.
- When simultaneously using two or more tuners, always set the tuners that use the same groups (other than group 00) to different channels in that group.
- The reception antennas and transmitter should be used at least 3 meters away from each other.



Operations

Operations

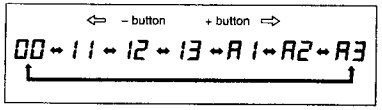
1 Turn the POWER switch ON.
After the "HELLO" message, the tuner status shown before the tuner was previously turned OFF appears on the display.

Note

POWER switch operation should be performed after disconnecting the input from connected equipment, as noise will be heard if the switch is turned ON or OFF beforehand.

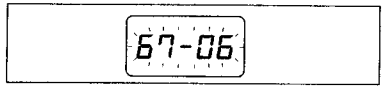
2 Press and hold the GP button down for more than one second.
The tuner goes to the group selection mode and the group number flashes.

3 Press the + or – button to select the group.
Pressing the + button cyclically changes the groups in numerical order and pressing the – button changes them in the reverse order.
Press and hold down the button to continuously change the display.

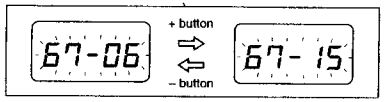


If no buttons are pressed for 5 seconds, the group selection mode is automatically canceled and the lowest frequency channel in the group selected at that time is displayed.
For Group 00, however, the channel previously set in Group 00 appears.

4 Press the CH button when the desired group is displayed.
The tuner goes to the channel selection mode and the channel number flashes.



5 Press the + or – button to select the channel.
Pressing the + button cyclically changes the channels of the group selected in step 3 in the listed order in the respective table in the "Wireless Channel Lists" on page 15 or 16. Pressing the – button changes them in the reverse order.



When you reach the last channel in the group, press the + button to return to the first channel in the group.
Likewise, press the – button to go from the first channel to the last channel.
When the group is set to 00, press either of these buttons to move through the 102 channels one by one.

(Continued)

6 After the desired channel is displayed, leave the unit for 5 seconds without pressing any buttons.
Channel selection mode is automatically canceled and the channel (or frequency) shown on the display is set.

Storing the group and channel

The selected group and channel set by the above procedure are stored in memory when the display stops flashing.

Distortion-check function

Before operating a wireless microphone or transmitter, you can check for possible distortion by using the distortion-check function of this unit. To check the distortion, simultaneously press the + and – buttons in the channel selection mode (the channel number flashes). The channels of the selected group are automatically switched one by one in sequence (this operation is called "scanning").

Notes

- When the MUNING switch is ON and the unit is not in the T OFF mode (see page 13), scanning stops and the channel at that time is selected if a tone signal (32.768 kHz) is detected in the signal received during scanning. However, scanning will not stop if a distorting signal having no tone signal is received.
  In this case, check for the distortion by observing the RF input level indicator.
- Scanning is automatically canceled when all the channels of the selected group are scanned twice. To cancel scanning in progress, press any of the operation buttons.
- If an extremely strong signal is received, scanning may stop at a point other than the actual channel.

Setting and Releasing the T (Tone Squelch) OFF Mode

The WRR-855A has the following three muting functions, which work in combination.

(1) Muting by RF input level: As sufficient S/N for the audio output may not be obtained if no RF signal is received or the RF input level is low, the audio output can be muted when the RF input level falls below the selected level.
(2) Tone squelch: The audio output is obtained only when the tuner receives an RF signal which includes a specified tone signal. The audio output is muted to eliminate noise which may be heard when the transmitter is turned on/off or the tuner receives an interference RF signal.
(3) Noise squelch: The audio output is muted to eliminate noise which may be heard when there is such excessive interference RF signal that the tone squelch does not work.

Only the muting functions described in (2) can be canceled by selecting the Tone-squelch OFF (T OFF) mode when desired. Apply this mode when you use a transmitter with no specified tone signal.

Selecting the T OFF mode

Turn the power ON while pressing and holding the GP and – buttons. Release the buttons after the "HELLO" message appears. "T OFF" is momentarily displayed and the tuner goes to the T OFF mode.
The T OFF mode is maintained even when the power is turned OFF.

Resuming from the T OFF mode

To cancel the T OFF mode, turn the power ON while pressing and holding the GP and + buttons, and release the buttons after "HELLO" appears on the display.
"T ON" is momentarily displayed and the tuner resumes the normal status.

Wireless Channels Selectable

The WRR-855A stores seven groups of selectable wireless channels: groups 00 (102 channels), 11 (12 channels), 12 (9 channels), 13 (9 channels), A1 (8 channels), A2 (6 channels), and A3 (6 channels) as shown in tables on pages 6 and 7.
The wireless channel groups other than group 00 are designed so that you can use all wireless channels of any one group simultaneously within the same UHF wireless microphone system without causing intermodulation. It is therefore recommended that you make it a rule to use a wireless channel group other than group 00 unless the use of group 00 is specifically necessary.

Each "wireless channel" is represented by a 2-digit TV channel number and another 2-digit number, for example: 66-23.

Notes

To eliminate interference or noise, please note the following.

- Do not use two or more wireless microphones or transmitters whose wireless channels are the same.
- If there is a TV broadcasting station nearby, to avoid possible interference from its broadcast, do not use that station's channel.
- The number of wireless channels actually usable in a multi-channel system may be smaller than the normal capacity of that system if there is interference from TV broadcasting or other RF signals.
- To operate two or more UHF synthesized wireless microphones/transmitters using the same wireless channel of the same group, ensure that the wireless microphones/transmitters are at least 100 m (330 feet)[1] apart as far as they are installed within sight of each other.
- When using two or more WRR-855As, do not directly put one unit upon the other.

1) The distance depends on the operating environment and conditions.

Wireless Channel Lists

Group 00: All channel access
Use to scan for open channels. Use only for a one channel system.

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
66-01	792.250	66-27	795.500	67-01	799.250	67-27	802.500
66-02	792.375	66-28	795.625	67-02	799.375	67-28	802.625
66-03	792.500	66-29	795.750	67-03	799.500	67-29	802.750
66-04	792.625	66-30	795.875	67-04	799.625	67-30	802.875
66-05	792.750	66-31	796.000	67-05	799.750	67-31	803.000
66-06	792.875	66-32	796.125	67-06	799.875	67-32	803.125
66-07	793.000	66-33	796.250	67-07	800.000	67-33	803.250
66-08	793.125	66-34	796.375	67-08	800.125	67-34	803.375
66-09	793.250	66-35	796.500	67-09	800.250	67-35	803.500
66-10	793.375	66-36	796.625	67-10	800.375	67-36	803.625
66-11	793.500	66-37	796.750	67-11	800.500	67-37	803.750
66-12	793.625	66-38	796.875	67-12	800.625	67-38	803.875
66-13	793.750	66-39	797.000	67-13	800.750	67-39	804.000
66-14	793.875	66-40	797.125	67-14	800.875	67-40	804.125
66-15	794.000	66-41	797.250	67-15	801.000	67-41	804.250
66-16	794.125	66-42	797.375	67-16	801.125	67-42	804.375
66-17	794.250	66-43	797.500	67-17	801.250	67-43	804.500
66-18	794.375	66-44	797.625	67-18	801.375	67-44	804.625
66-19	794.500	66-45	797.750	67-19	801.500	67-45	804.750
66-20	794.625	66-46	797.875	67-20	801.625	67-46	804.875
66-21	794.750	66-47	798.000	67-21	801.750	67-47	805.000
66-22	794.875	66-48	798.125	67-22	801.875	67-48	805.125
66-23	795.000	66-49	798.250	67-23	802.000	67-49	805.250
66-24	795.125	66-50	798.375	67-24	802.125	67-50	805.375
66-25	795.250	66-51	798.500	67-25	802.250	67-51	805.500
66-26	795.375			67-26	802.375		

Wireless Channels Selectable

Group 11: 12-channel group
Use when both TV channels 66 and 67 are available.

Channel	Frequency (MHz)
66-02	792.375
66-07	793.000
66-17	794.250
66-19	794.500
66-35	796.500
66-43	797.500
67-08	800.125
67-19	801.500
67-33	803.250
67-39	804.000
67-42	804.375
67-46	804.875

Group 12: 9-channel group
Use when TV channel 66 is on the air.

Channel	Frequency (MHz)
67-01	799.250
67-03	799.500
67-11	800.500
67-16	801.125
67-23	802.000
67-27	802.500
67-41	804.250
67-44	804.625
67-50	805.375

Group 13: 9-channel group
Use when TV channel 67 is on the air.

Channel	Frequency (MHz)
66-01	792.250
66-03	792.500
66-11	793.500
66-16	794.125
66-23	795.000
66-27	795.500
66-41	797.250
66-44	797.625
66-50	798.375

Group A1: 8-channel group
Use when both TV channels 66 and 67 are available.

Channel	Frequency (MHz)
66-02	792.375
66-04	792.625
66-12	793.625
66-24	795.125
67-02	799.375
67-29	802.750
67-35	803.500
67-44	804.625

Group A2: 6-channel group
Use when TV channel 66 is on the air.

Channel	Frequency (MHz)
67-06	799.875
67-15	801.000
67-21	801.750
67-32	803.125
67-46	804.875
67-50	805.375

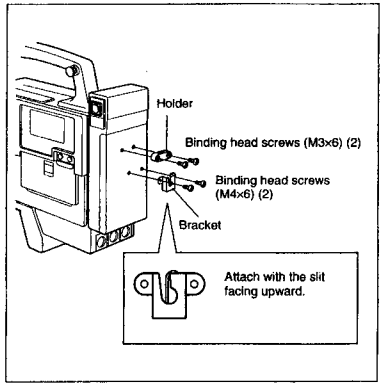
Group A3: 6-channel group
Use when TV channel 67 is on the air.

Channel	Frequency (MHz)
66-06	792.875
66-15	794.000
66-21	794.750
66-32	796.125
66-46	797.875
66-50	798.375

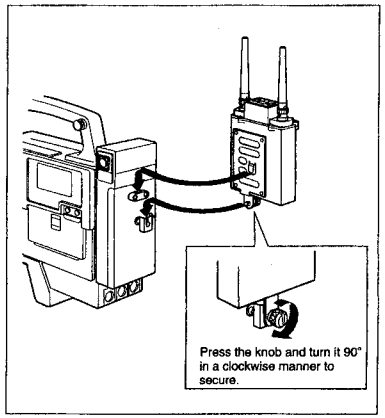
Attaching and Connecting to a Betacam

Use the Betacam attachment kit supplied with the BTA-801 Portable Tuner Mount Adapter.

1 Attach the holder and bracket to the Betacam.

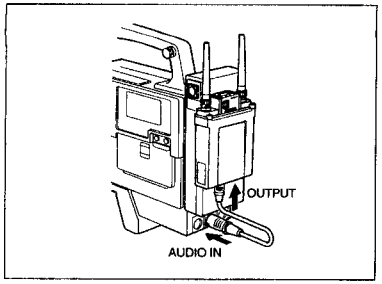


2 Align the attachment plate of the back of the BTA-801 with the holder and bracket.



Attaching and Connecting to a Betacam

3 Connect the output cable (optional).



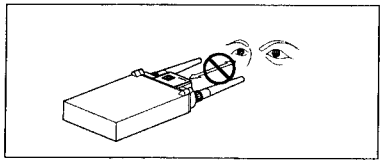
4 Connect the DC power cable supplied with the BTA-801.

For the power cable connection, see page 9.

Precautions

On operation

- The tuner unit must be used within the temperature range of 0°C to 50°C (32°F to 122°F). Avoid using for an extended period time in extremely high temperature, or the place subject to direct sunlight, especially outdoors, because the finish of the case might be damaged. Never install the tuner on or near heat sources, such as lighting equipment, power amplifiers.
- The tuner is designed to be portable and is built to resist humidity and dust. However, try to avoid using in very humid or dusty places, because such use may shorten the life of the tuner unit.
- To avoid degradation of the signal-to-noise ratio, do not use the tuner in noisy places or in locations subject to vibration, for example:
  - near electric equipment such as motors, transformers or dimmers
  - near air conditioning equipment or places subject to direct air flow from an air conditioner
  - near a public address loudspeaker
  - in a location where adjacent equipment might knock against the tuner.
- The switching of lights may produce electrical interference over the entire frequency range. Position the tuner and the wireless microphone in a place where such interference is at minimum.
- The tuner unit is precisely adjusted at the factory and no adjustment before use is necessary. Do not touch the inside of the unit or try to repair it by yourself.
- When looking into the upper-panel displays, be careful to keep a sufficient distance between your eyes and the tuner unit.



On cleaning

Clean the tuner unit with a dry, soft cloth. Never use thinner or benzine, since these will damage the finish.

Messages on the Display

In addition to the normal indications, the following messages may appear on the liquid-crystal display.

Messages	Contents	Measures
Err 01	An error occurred in backup memory data.	The data was initialized. Perform the receiving group/ channel selection and muting setting again.
Err 02	The PLL synthesized circuit is in trouble.	Contact your Sony dealer.
Err 03	The operating voltage exceeds the allowable value.	Contact your Sony dealer.
TONE	As no tone signal is available or a tone signal other than 32.768 kHz is being received, the audio signal output is being muted.	Set the tuner to the T OFF mode (see page 13) to output the audio signal.
T OFF a)	The tuner is set in T OFF mode.	For details, see "Selecting and Releasing the T (Tone Squelch) OFF Mode" on page13.

a) This message appears after "HELLO" message when the tuner is turned on. Subsequently, the tuner goes to the normal display status.

Specifications

Tuner section

Type of reception	110KF3E
Circuit system	Dual conversion superheterodyne
Receiving frequencies	792.250 to 805.500 MHz
Local oscillators	1st: Crystal controlled PLL synthesizer 2nd: Crystal oscillator
Reference deviation	±5.0 kHz
Selectivity	60 dB or more (at ±250 kHz detuned)
Surplus distortion ratio	80 dB or more
Image distortion ratio	80 dB or more
Muting level	10 dBμ (ON/OFF possible)
Antenna connectors	BNC-R type (2), 50 ohms
Frequency response	50 to 15,000 Hz ±3.0 dB
De-emphasis	50 μsec
Signal-to-noise ratio	(±5.0 kHz deviation at 1 kHz modulation) 30 dB or more at RF input level 10 dBμ (A-weighted) 60 dB or more at RF input level 60 dBμ (A-weighted)
Distortion	1.0% or less (±40 kHz deviation at 1 kHz modulation)
Tone signal frequency	32.768 kHz
Output level	–40 dBu (0 dBu=0.775 Vrms, ±5.0 kHz deviation at 1 kHz modulation)
Output impedance	25 ohms, unbalanced
Output connector	15-pin D-sub connector (1)

General

Power requirements	DC 7 V (when using the BTA-801)
Operating voltage	DC 6.5 to 9.0 V
Current consumption	200 mA DC or less (at DC 7 V)
Operating temperature	0°C to +50°C (32°F to 122°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Dimensions	88 × 118.8 × 31.3 mm (w/h/d) ($3^{1}/_{2} \times 4^{3}/_{4} \times 1^{1}/_{4}$ inches)
Mass	Approx. 280 g (9.9 oz) with the supplied antennas attached
Supplied accessories	Antennas (2) Operating instructions (1)

Optionalaccessories

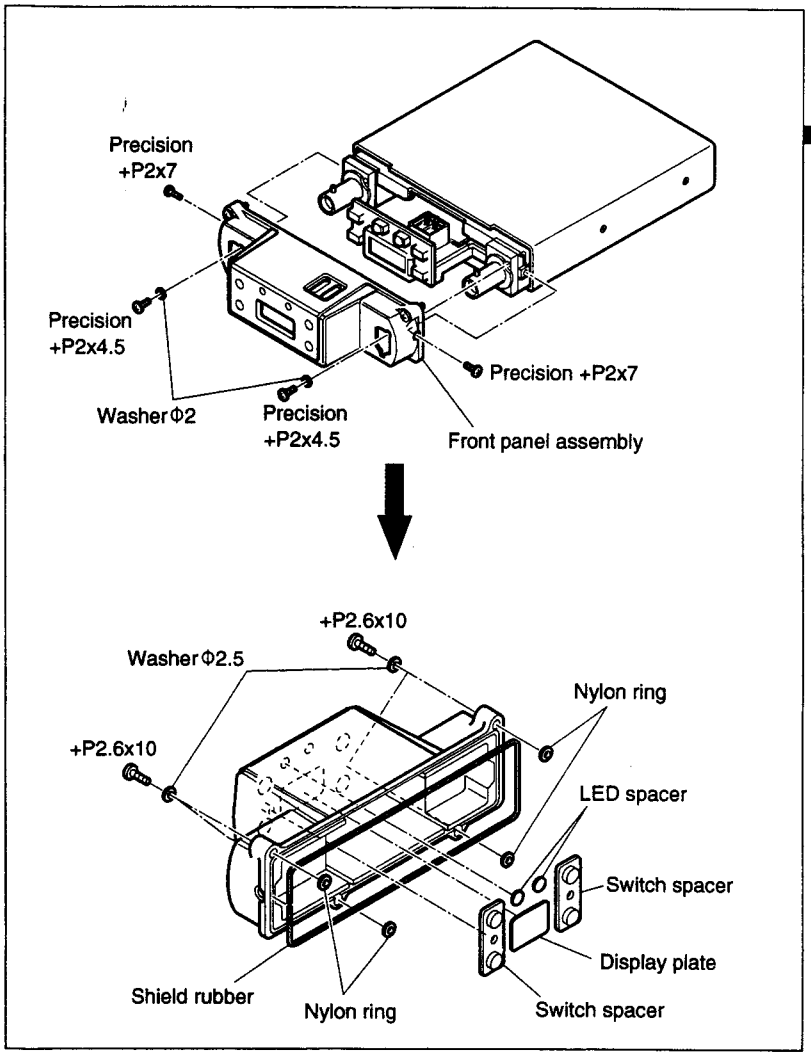
Portable Tuner Mount Adapter: BTA-801
Microphone cable (for Audio output cable):
EC-0.5C2-F (XLR-3-11C type ↔ XLR-3-11C type)
EC-0.5C2 (XLR-3-11C type ↔ XLR-3-12C type)

Design and specifications are subject to change without notice.

Section 2
Service Overview

2-1. Removal

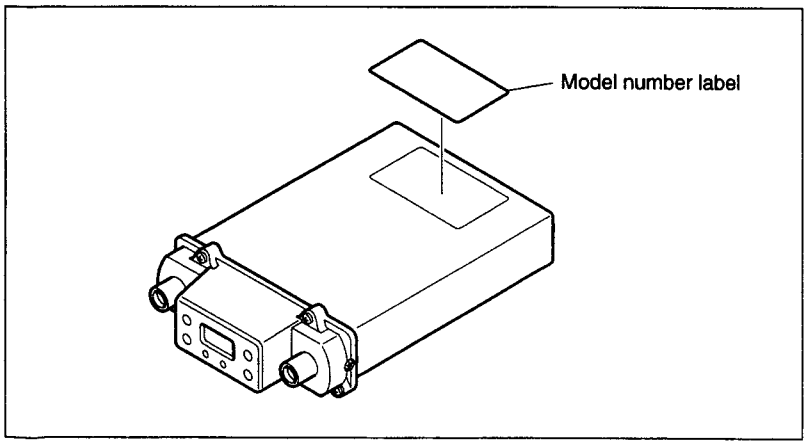
Front Panel Assembly



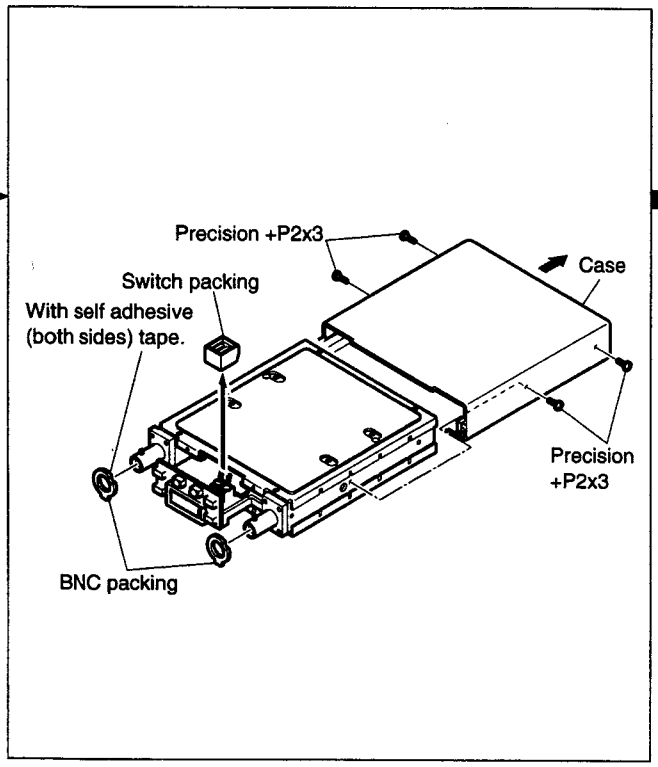
to page 2-2

to page 2-2

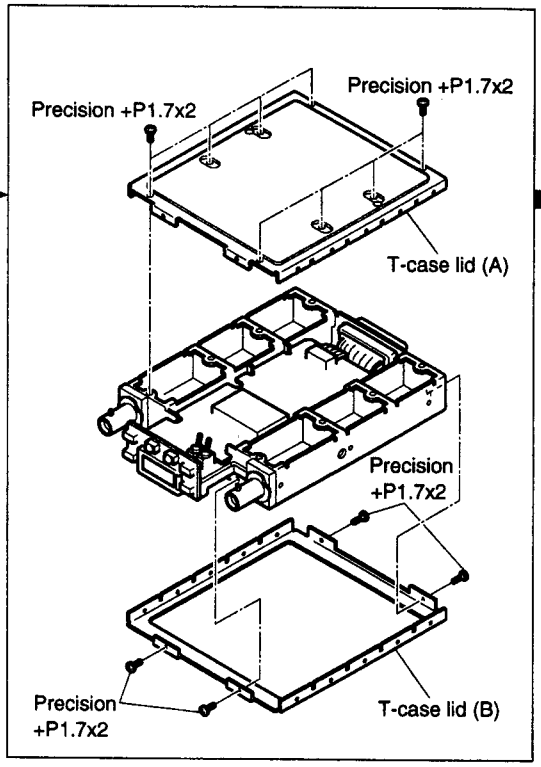
Model Number Label



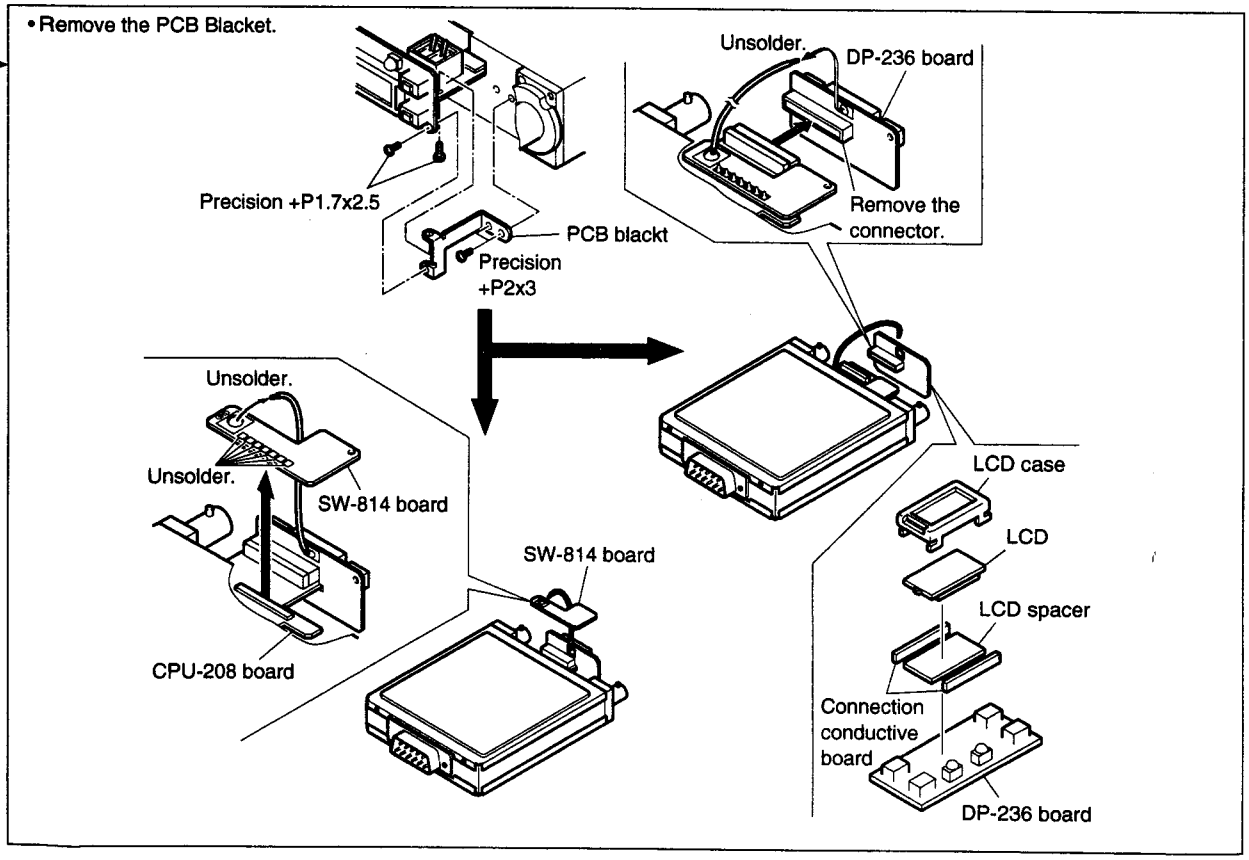
BNC Packing, Switch Packing, Case



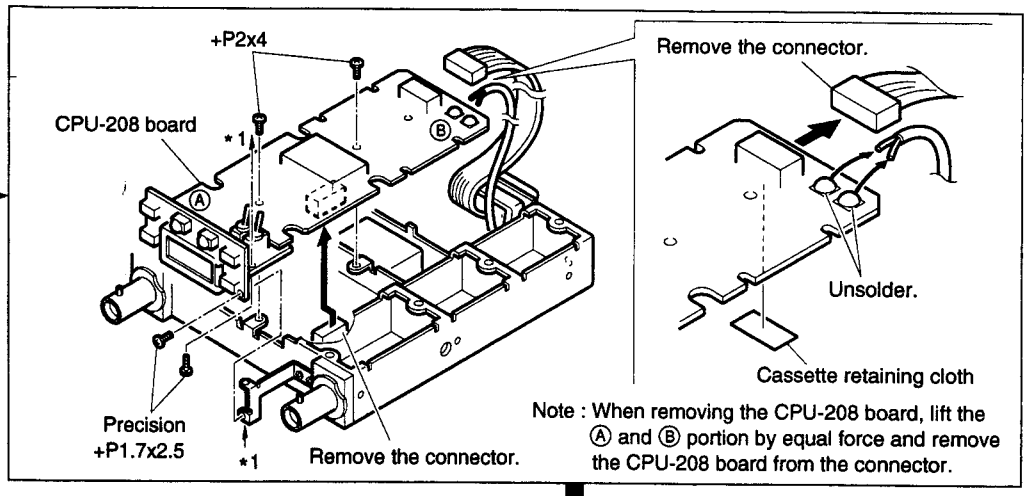
T-case Lid (A), T-case Lid (B)



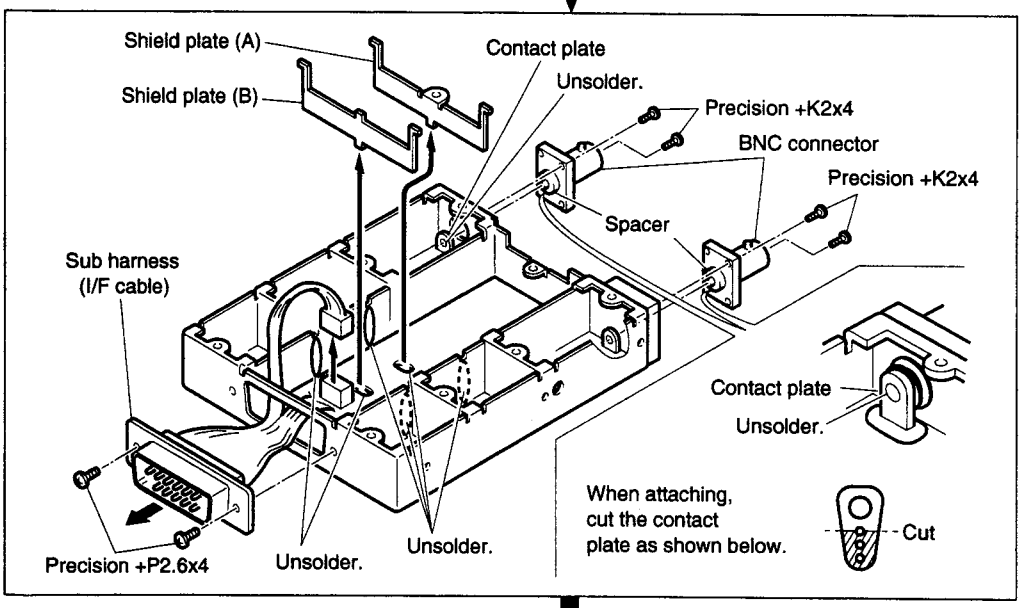
SW-814 Board, DP-236 Board, LCD



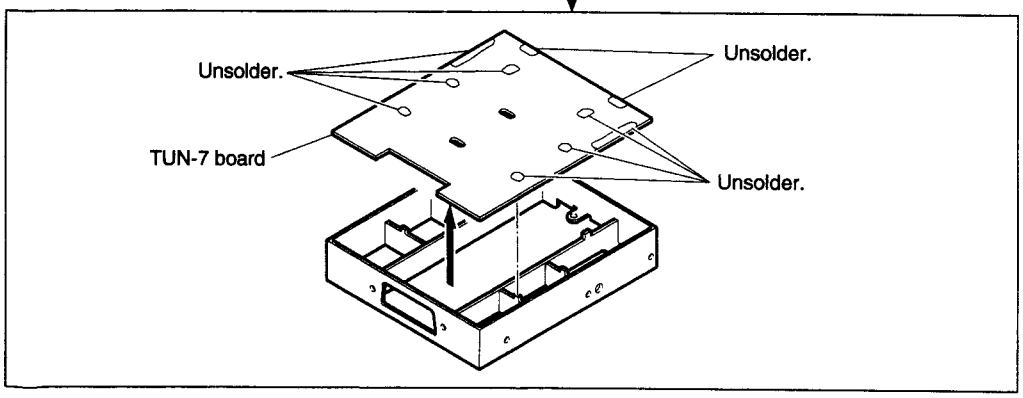
CPU-208 Board



BNC Connector, Sub harness (I/F Cable), Shield Plate (A), Shield Plate (B)



TUN-7 Board

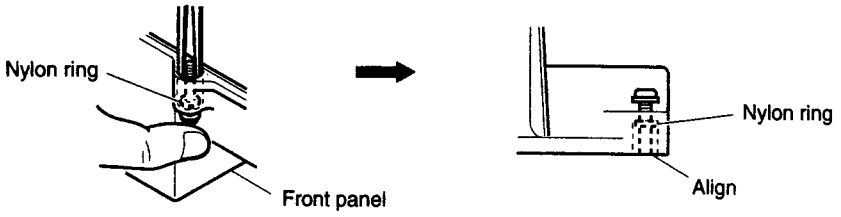


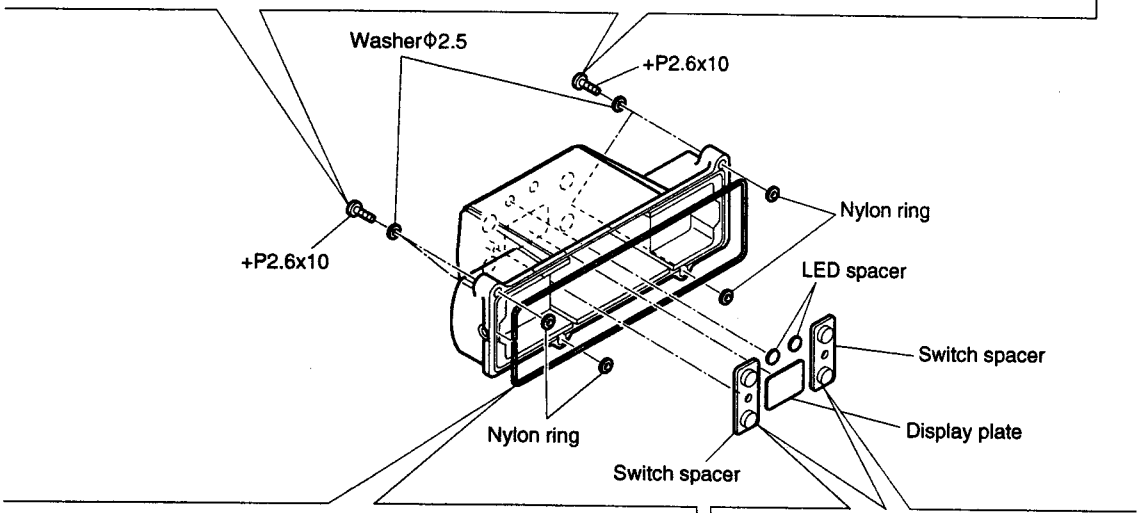
2-2. Notes on Parts Replacement

2-2-1. Front Panel Assembly

1. Replacing the Nylon Ring
The WRR-855A is attached to a Camcorder or its adapter using four screws (+P2.6x10) on the front panel assembly. The nylon rings must therefore be attached to the correct position so that the these screws have the same length.

How to attach the nylon rings
① Push in a nylon ring to the deepest end using tweezers.
② Use a flat plane to align the tips of the screws with the front panel.

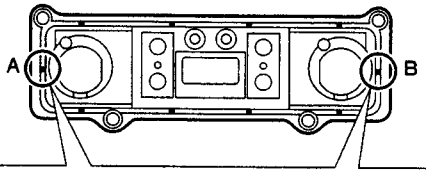


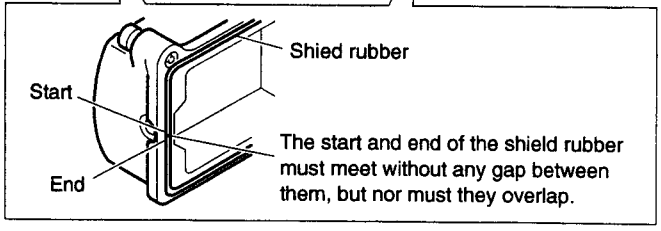


2. Replacing the Shield Rubber
Replace the shield rubber as follows.

① Cut a length of shield rubber (min. 204 mm, preferably about 210 mm).
② Coat the ten locations marked with black round marks (●) in the following illustration with adhesive.
(approximately 0.1 ml (mg) for each location)
* Required adhesive : Loctite Prism 454 (commercially available)

③ Attach the shield rubber starting from either point A or B.
The start and end of the shield rubber must meet without any gap between them. Cut and remove the surplus length of the shield rubber.

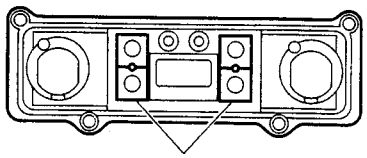



Shied rubber
Start
End
The start and end of the shield rubber must meet without any gap between them, but nor must they overlap.

3. Replacing the Switch Spacer
The switch spacer is used as drip-proof part. When replacing the switch spacer, follow the procedure below and attach it securely.

① Coat the area shown in the following illustration with adhesive.
* Required adhesive : Loctite Prism 454 (commercially available)

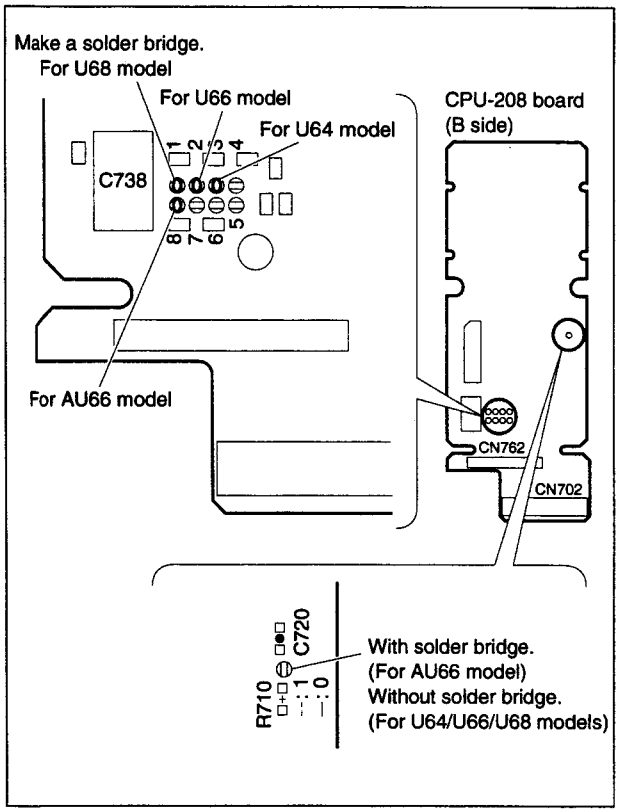
② While aligning the hole of the switch spacer with the protrusion of the front panel, attach the switch spacer on the front panel.
Note : Press the area of the switch spacer which is coated with adhesive for 5 seconds for each area (using the back of tweezers) until the switch spacer is firmly attached.



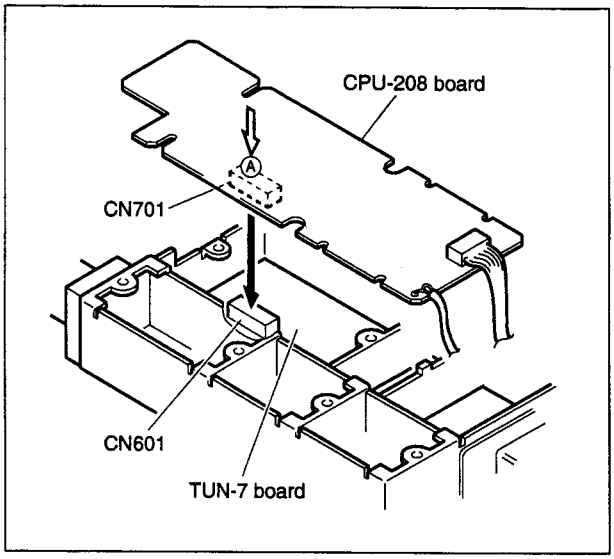
Apply the adhesive on the bold line.

2-2-2. CPU-208 Mounted Circuit Board

1. When replacing the CPU-208 mounted circuit board, solder the slit land on the new CPU-208 mounted circuit board as shown below. After replacing the board, perform the same procedure as section "2-3. Precautions When Replacing EEPROM".



2. When attaching the CPU-208 mounted circuit board into the unit, press the Ⓐ portion as shown below and insert the CPU-208 mounted circuit board into the connector (CN-601) of the TUN-7 mounted circuit board firmly so that the CPU-208 mounted circuit board is securely attached.



2-3. Precautions When Replacing EEPROM

If the EEPROM (IC702 on the CPU-208 board) is replaced, do the following.
When the power of the WRR-855A is turned on for the first time after the replacement:

① "ERROR 01" appears on the LCD, and data is automatically initialized.
After initialization is completed, "64-01" (For U64 model), "66-01" (For U66 model), "68-01" (For U68 model) or "66-01" (For AU66 model) appears on the LCD.

② After "64-01" (For U64 model), "66-01" (For U66 model), "68-01" (For U68 model) or "66-01" (For AU66 model) is displayed, perform section "3-2-1. item 4, Muting Level and RF Level Adjustment".

2-4. Error Messages

The following error messages will appear if an error is detected by the built-in self diagnostics function of the WRR-855A.

Error Message	Contents	Countermeasure
Error01	Error in the backup memory.	Because data is initialized, perform the group setting, channel setting and muting again. Check IC702 on the CPU-208 board and its peripheral circuit.
Error02	PLL synthesizer circuit failed.	Check the PLL synthesizer circuit (IC301, CP301 and its peripheral circuit) on the TUN-7 board.
Error03	The circuit voltage in the tuner unit assembly is abnormal.	Check the Q653, IC651/TUN-7 board and its peripheral circuit.
TONE	The tone signal is not present, or the audio signal output is muted because the receiver received a tone signal other than 32.768 MHz signal.	Refer to the section "Muting OFF Mode" in the Operation Manual.

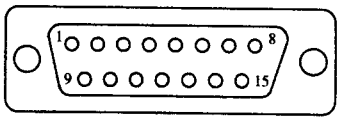
2-5. Service Functions

Set or release the muting function by operating the buttons on the front panel of the WRR-855A.

Function Name	Function	Setting Procedure	Release Procedure	Default Factory Setting
T OFF mode	Muting OFF by tone squelch	While pressing the GP and "-" key at the same time, turn on the power.	While pressing the GP and "+" key at the same time, turn on the power.	T OFF mode is released.

2-6. Connector Input Signal

D-Sub 15-pin Male



Pin No.	Signal	Contents	
1	GND	GND for AF output signal	
2	AF OUTPUT	AF output signal (unbalanced type)	
3	NC	NC	
4	DC +7V	Power supply input (+7Vdc)	
5	GND	GND for power supply	
6	REM	Remote (Internal /Ext)	H: external
7	EXT SW	External power switch input	H: power on
8	Digital GND	Digital I/O	
9	I/F out (CLK)	Digital I/O	
10	/F in (CS)	Digital I/O	
11	I/F in (DI)	Digital I/O	
12	I/F out (DO)	Digital I/O	
13	N C	N C	
14	EXT OSC IN	External clock input	
15	OSC GND	GND for external clock	

Section 3
Electrical Alignment

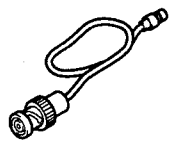
3-1. Preparation

3-1-1. Equipment and Tools

Equipment

Name	Specifications	Model name
Signal generator	Frequency range : 100 kHz to 990 MHz	HEWLETT PACKARD 8656B or equivalent
Spectrum analyzer	Frequency range : 10 kHz to 3 GHz	ADVANTEST TR4131 or equivalent
DC volt meter (Multi meter)	Effective digits: 3 1/2 digits	–
Audio analyzer (Distortion meter)	Frequency range : 10 Hz to 100 kHz Measurment range : 0.1 to 100%	HEWLETT PACKARD 334A or equivalent
RF millivolt meter	Frequency range : 10 kHz to 1000 MHz	MEGRO MV-19B, C (with 50 Ω termination prove chip MP-3109) or equivalent
Level meter	Frequency range : 20 Hz to 100 kHz	–
Noise meter	Frequency range : 10 Hz to 500 kHz Filter (Included) : A weighted filter	MEGRO MN-445B or equivalent
Tracking generator	Frequency range: 100 kHz to 2 GHz	ADVANTEST TR4153A or equivalent
Function generator	32.768 kHz±1 Hz signal (sine wave) can be generated.	HEWLETT PACKARD 8904A or equivalent
Mic amp	Gain: 0 dB to 70 dB (with A-weighted filter)	–
Oscilloscope	Frequency range: DC to 30 MHz	–

Tools

Name	Part No.	Remarks
RF adjustment cable	J-6400-680-A	
Adjuster (0.4×1.3 mm)	7-721-052-81	For adjustment
Power supply/AF OUT connector	–	Refer to "How to make power supply/AF OUT connector".

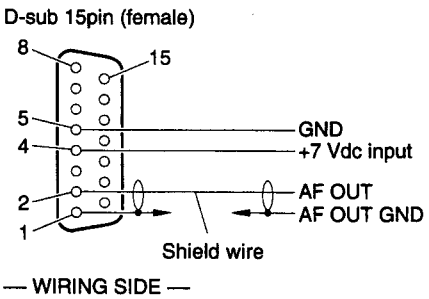
• How to make power supply/AF OUT connector

Parts Required

D-sub, 15 pin, female connector. (Part No.1-563-078-11)

To connect a measurement equipment and DC power supply to the WRR-855A D-sub connector, locally make the power supply/AF OUT connector as shown in the following diagram using a D-sub, 15 pin, female connector.

Wiring diagram



3-2. Adjustments

This section describes the following adjustment (and checks) required to satisfy the specifications.

Adjustment Item

3-2-1. TUN-7 Board Adjustment
1. Front-end Adjustment
2. 1st Local Adjustment
3. IF Adjustment
4. Muting Level and RF Level Adjustment
5. FM Detector Adjustment
6. Output Level Adjustment
7. S/N Check
8. Noise Squelch Check
9. Tone Squelch Check

3-2-2. Overall Characteristic Confirmation
1. Current Consumption Check
2. S/N Check
3. Frequency Caracteristic Check
4. Distortion Ratio Check
5. RF Input Level Indication Check
6. AF Indicator Check

Note

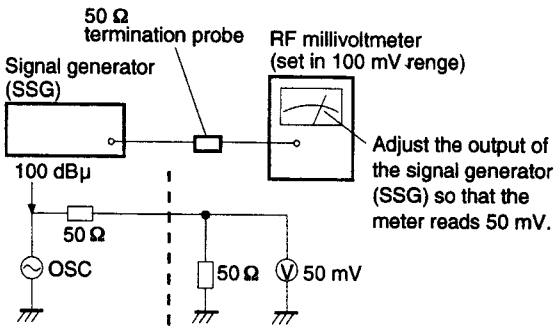
0 dB μV_{EMF} = −113 dBm
EMF: Electromotive force
0 dBm = 1 mW at 50 Ω loaded

Note on Adjustment

The RF level of the input signal (the output level of the signal generator) for adjustment is expressed as an open ended voltage in unit dBμ (where 0 dBμ= 1 μV). The adjustment is to be carried out by calibrating the output level of the signal generator as shown below.

Calibration Method

(1) Connect the RF milivoltmeter to the signal generator as shown in the figure below.



(2) Adjust the level of the output signal from the signal generator (SSG) so that the RF millivoltmeter reads 50 mV. The level of the output signal from the signal generator (SSG) when the RF millivoltmeter reads 50 mV shall be specified as 100 dBμ (at no load).

3-2-1. TUN-7 Board Adjustment

Preparation

Before the adjustments, perform the followings.

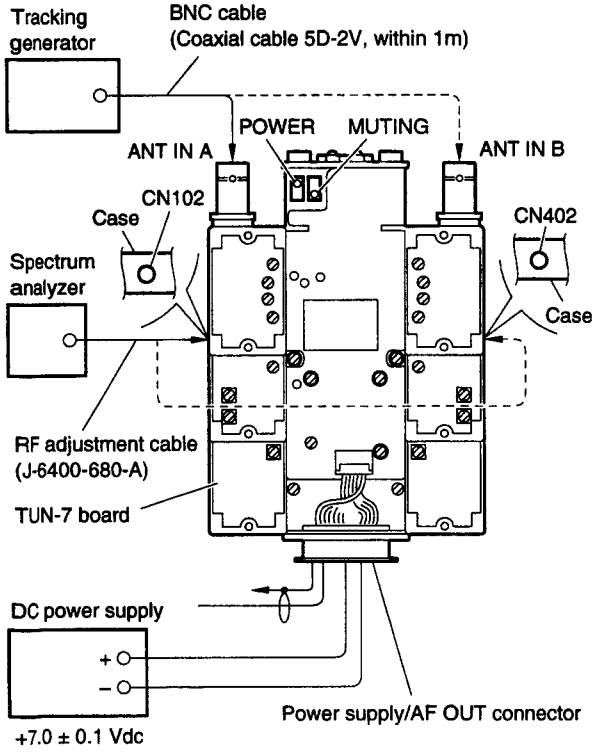
- Remove the case and front panel.
- Remove the case lid (Precision +P1.7×2: 8) of the unit assembly. (Refer to the "2-1. Removal".)

1. Front-end Adjustment

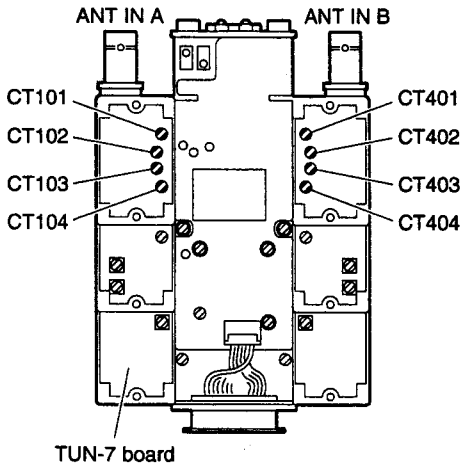
Equipment and Tools

- DC power supply + 7.0±0.1 Vdc
- Spectrum analyzer
- RF adjustment cable (Part No. J-6400-680-A)
- Adjuster (0.4×1.3 mm) : 1 (Part No. 7-221-652-81)
- Power supply/AF OUT connector
  (Refer to the "How to make power supply/AF OUT connector" on page 3-1.)

Connection



Adjustment Location



Switch and Control Setting

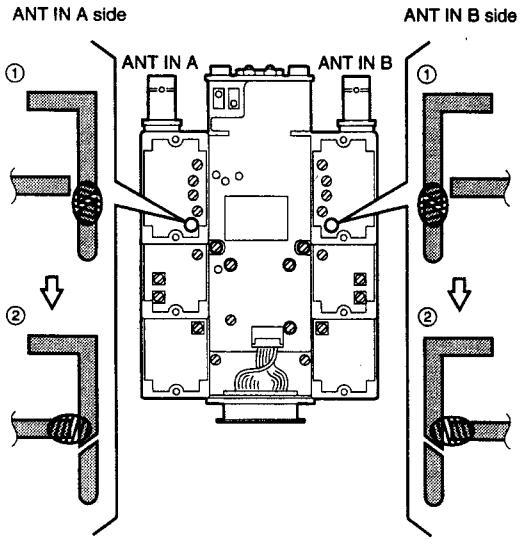
Channel setting:

U64 model; Group 00, 65-01 channel (776.125 MHz)
U66 model; Group 00, 67-01 channel (788.125 MHz)
U68 model; Group 00, 69-16 channel (802.000 MHz)
AU66 model; Group 00, 67-16 channel (801.125 MHz)

Procedure

Step1: Preparation

Turn off the POWER switch of the WRR-855A, and change the position of the soldering bridge to the printed slit land on the TUN-7 board from ① to ② as shown below.



Step2: Adjustment

(1) Connect the tracking generator to the ANT IN A connector of the TUN-7 board.

(2) Connect the spectrum analyzer to the CN102 connector of the TUN-7 board using the RF adjustment cable.

(3) Set the tracking generator and spectrum analyzer as follows:

Tracking generator setting

OUT PUT level: –30±0.1 dBm

Out put level setting is to be performed by connecting the tracking generator directly to the spectrum analyzer.

Spectrum analyzer setting

CENTER FREQUENCY:

U64 model; 776.125 MHz

U66 model; 788.125 MHz

U68 model; 802.000 MHz

AU66 model; 801.125 MHz

REF (Reference) LEVEL : –10 dBm

FREQUENCY SPAN : 50 MHz (5 MHz/DIV)

AMPLITUDE SCALE : 5 dB/DIV

ATT (Input attenuation) : 10 dB

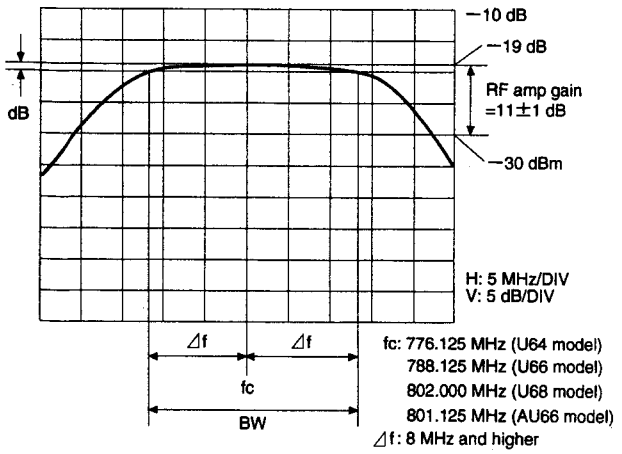
RBW (Resolution per bond width) : 100 MHz

VBW (Video band width) : 30 kHz

(4) Adjustment (ANT IN A side)

Specification : RF Amplifier gain = 11±1 dB
Band width (BW) = ±8 MHz or more (within 1 dB according to the center frequency level)

Adjustment : Alternately ⊘CT101, CT102, CT103 and CT104/TUN-7 board



(5) Connect the tracking generator to the ANT IN B connector of the TUN-7 board.

(6) Connect spectrum analyzer to the CN402 connector of the TUN-7 board.

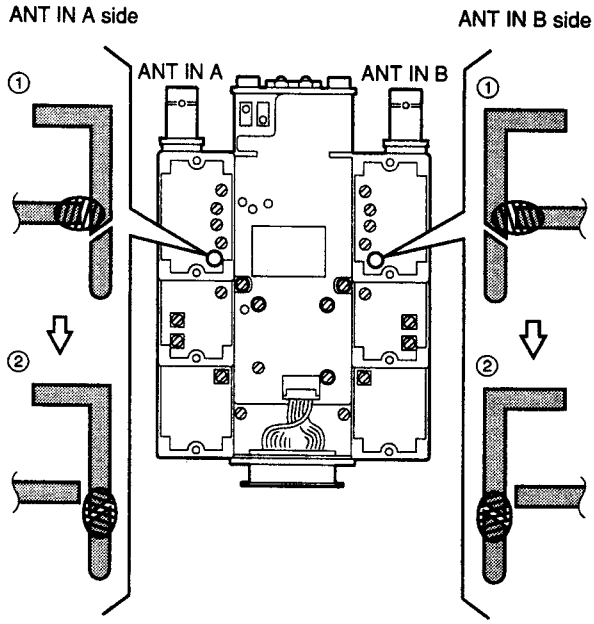
(7) Adjustment (ANT IN B block)

Specification : The same as procedure (4) above.

Adjustment : Alternately ⊘CT401, CT402, CT403 and CT404/TUN-7 board

Step3: Works after completing adjustment

After completing adjustment, turn off the main power of the WRR-855A, and change the soldering bridge of the slit land of the TUN-7 board as shown below. (① → ②)

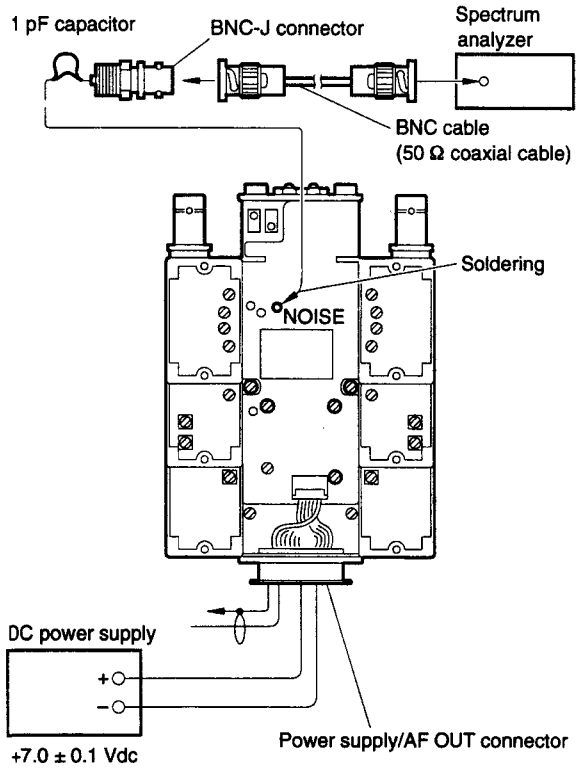


2. 1st Local Adjustment

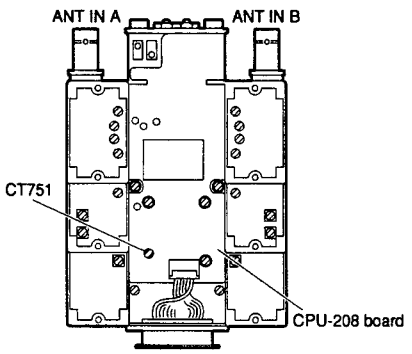
Equipment and Tools

- DC power supply: + 7.0±0.1 Vdc
- Spectrum analyzer
- Adjuster (0.4×1.3 mm) : 1 (Part No. 7-221-652-81)
- Ceramic capacitor 1 pF (Part No. 1-102-934-00)
- Power supply/AF OUT connector
  (Refer to the "How to make power supply/AF OUT connector" on page 3-1).

Connection



Adjustment Location



Switch and Control Setting

Channel setting:

U64 model; Group 00, 65-01 channel (776.125 MHz)
U66 model; Group 00, 67-01 channel (788.125 MHz)
U68 model; Group 00, 69-16 channel (802.000 MHz)
AU66 model; Group 00, 67-16 channel (801.125 MHz)

MUTING: OFF

Adjustment Procedure

(1) Set the spectrum analyzer as follows:
CENTER FREQUENCY :
U64 model; 926.875 MHz
U66 model; 938.875 MHz
U68 model; 952.750 MHz
AU66 model; 951.875 MHz

Note

Perform the center frequency setting by using the signal generator.
REFERENCE LEVEL : −10 dBm
FREQUENCY SPAN : 50 kHz (5 kHz/DIV)
AMPLITUDE SCALE : 10 dB/DIV
ATT (Input attenuator) : 0 dB

(2) Connect the spectrum analyzer probe to the NOISE- terminal (land) of the CPU-208 board with 1 pF ceramic capacitor.

(3) Adjust the ⊘CT751/CPU-208 board under condition (2) above so that the frequency meets the specification below.

Specification:

U64 model; 926.875 MHz ±5 kHz
U66 model; 938.875 MHz ±5 kHz
U68 model; 952.750 MHz ±5 kHz
AU66 model; 951.875 MHz ±5 kHz

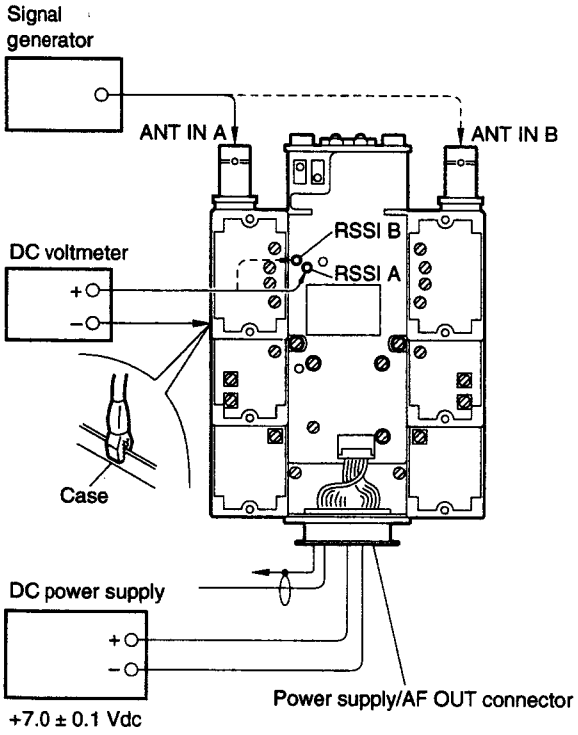
Adjustment: ⊘CT751/CPU-208 board

3. IF Adjustment

Equipment and Tools

- DC power supply: + 7.0±0.1 Vdc
- Signal generator
- DC voltmeter (Digital multimeter)
- Adjuster (0.4×1.3 mm): 1 (Part No. 7-221-652-81)
- Power supply/AF OUT connector
  (Refer to the "How to make power supply/AF OUT connector" on page 3-1.)

Connection



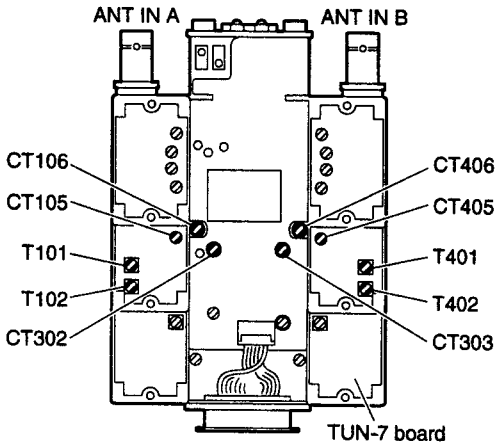
Switch and Control Setting

Channel setting:

U64 model; Group 00, 65-01 channel (776.125 MHz)
U66 model; Group 00, 67-01 channel (788.125 MHz)
U68 model; Group 00, 69-16 channel (802.000 MHz)
AU66 model; Group 00, 67-16 channel (801.125 MHz)

MUTING: OFF

Adjustment Location



Procedure

Step1: ANT IN A side adjustment

(1) Connect the signal genarator to the ANT IN A connector.
(2) Connect the DC voltmeter to the RSSI (A) terminal (land) of the CPU-208 board.
(3) Set the signal generator as follows:
Signal genarator setting
FREQUENCY (Carrier frequency) :
U64 model; 776.125 MHz
U66 model; 788.125 MHz
U68 model; 802.000 MHz
AU66 model; 801.125 MHz

RF OUTPUT (Output level) : 30 dBμ (= –83 dBm)
Set (Calibrate) the output level by using the RF voltmeter. (Refer to "Calibration method" on page 3-2.)
MODULATION (Modulation frequency) : OFF (No modulation)

(4) Adjustment
Specification : RSSI (A) terminal voltage = Maximum (approx. 1.6 Vdc or more)
Adjustment : ●CT105, CT106, CT302, T101 and T102/TUN-7 board.
Adjust the CT105, CT106 and CT302 alternateley.

(5) When the voltage of RSSI (A) is get maximum level in procedure (4), set the output level of the signal genera-tor to 10 dBμ (= –103 dBm) .
(6) Perform the procedure (4) above.
Specification : RSSI (A) terminal voltage = Maximum (1.3 Vdc or more)

Step2: ANT IN B side adjustment

(1) Connect the signal generator to the ANT IN B connector.

(2) Connect the DC voltmeter to the RSSI (B) terminal of the CPU-208 board.

(3) Perform the procedures (3) through (6) in step 1 above. Perform the same adjustment with the components listed below on the right.

ANT IN A side		ANT IN B side
●CT105, CT106,CT302, T101 and T102 /TUN-7 board	→	●CT405, CT406, CT303 T401 and T402 /TUN-7 board
RSSI (A)	→	RSSI (B)

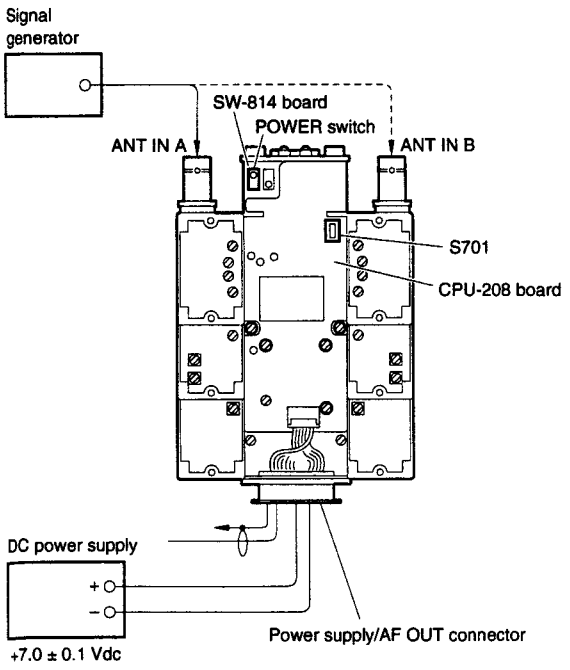
4. Muting Level and RF Level Adjustment

This adjustment is performed automatically by the learning function of the WRR-855A (RSSI learning).

Equipment and Tools

- DC power supply: + 7.0±0.1 Vdc
- Signal generator
- Power supply/AF OUT connector
  (Refer to the "How to make power supply/AF OUT connector" on page 3-1.)

Connection



Switch and Control Setting

Channel setting:

U64 model; Group 00, 65-01 channel (776.125 MHz)
U66 model; Group 00, 67-01 channel (788.125 MHz)
U68 model; Group 00, 69-16 channel (802.000 MHz)
AU66 model; Group 00, 67-16 channel (801.125 MHz)

MUTING: OFF

Procedure

Step1: Set the signal generator as follows:

Signal generator setting
FREQUENCY (Carrier frequency):
U64 model; 772.000 MHz
U66 model; 784.000 MHz
U68 model; 796.000 MHz
AU66 model; 795.000 MHz
RF OUTPUT (Output level): 30 dBμVEMF
(= −83 dBm)
MODULATION (Modulation frequency) : OFF
(No modulation)

Step2: Adjustment

(1) Connect the signal generator to the ANT IN A connector.

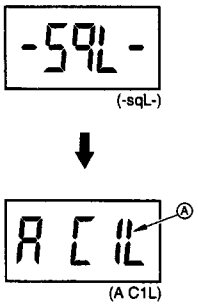
(2) Turn OFF the POWER switch (S901 switch on the SW-814 board).

(3) Set the RF OUTPUT (output level) of the signal generator to the OFF.

(4) Turn ON the POWER switch (S901 switch on the SW-814 board) with the S701 switch on the CPU-208 board.

(5) Indication on LCD (display) appears as follows:

LCD :



(6) Set the RF OUTPUT (output level) of the signal generator to the ON.

(7) Check first that indication "L" (after the frequency indication) on the LCD has disappeared, and then press the S701 switch on the CPU-208 board.

Note

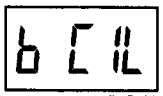
If the "L" indication does not disappear from the LCD (on "A" area: refer to the previous step (5)) (when the RF input level is lower than the reference level) or "H" is displayed (when the RF input level is higher than the reference level) , perform the following adjustment.

① Check the RF output level and frequency of the signal generator (perform re-setting if necessary), and repeat from step (1).

② If the above conditions (the "L" indication does not disappear, or "H" is displayed) remain even after re-adjustment, perform the "3-2-1. TUN-7 Board Adjustment" from item 1 to item 3.

(8) Indication on LCD (display) appears as follows:

LCD :



(b C1L)

(9) Connect the signal generator to the ANT IN B connector.

(10)Check first that indication "L" (after the frequency indication) on LCD has disappeared, and then press the S701 switch on the CPU-208 board.

(11)Indication on LCD (display) appears as follows:

LCD :

(A C2L)

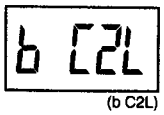
(12)Following the guide shown under (11) , connect the signal generator to the ANT IN A connector.
Set the FREQUENCY (carrier frequency) of the signal generator as follows:

U64 model; 776.000 MHz
U66 model; 788.000 MHz
U68 model; 800.000 MHz
AU66 model; 799.000 MHz

(13)Check first that indication "L" (after the frequency indication) on LCD has disappeared, and then press the S701 switch on the CPU-208 board.

(14)Indication on LCD (display) appears as follows:

LCD :



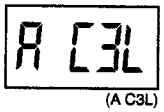
(b C2L)

(15)Connect the signal generator to the ANT IN B connector.

(16)Check first that indication "L" (after the frequency indication) on LCD has disappeared, and then press the S701 switch on the CPU-208 board.

(17)Indication on LCD (display) appears as follows:

LCD :



(A C3L)

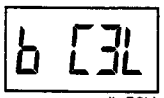
(18)Following the guide shown under (17) , connect the signal generator to the ANT IN A connector. Set the FREQUENCY (carrier frequency) of the signal generator as follows:

U64 model; 780.000 MHz
U66 model; 792.000 MHz
U68 model; 804.000 MHz
AU66 model; 804.000 MHz

(19)Check first that indication "L" (after the frequency indication) on LCD has disappeared, and then press the S701 switch on the CPU-208 board.

(20)Indication on LCD (display) appears as follows:

LCD :



(b C3L)

(21)Following the guide shown under (20) , connect the signal generator to the ANT IN B connector.

(22)Check first that indication "L" (after the frequency indication) on LCD has disappeared, and then press the S701 switch on the CPU-208 board.

(23)Indication on LCD (display) appeares as follows:

LCD :

(HELLO)

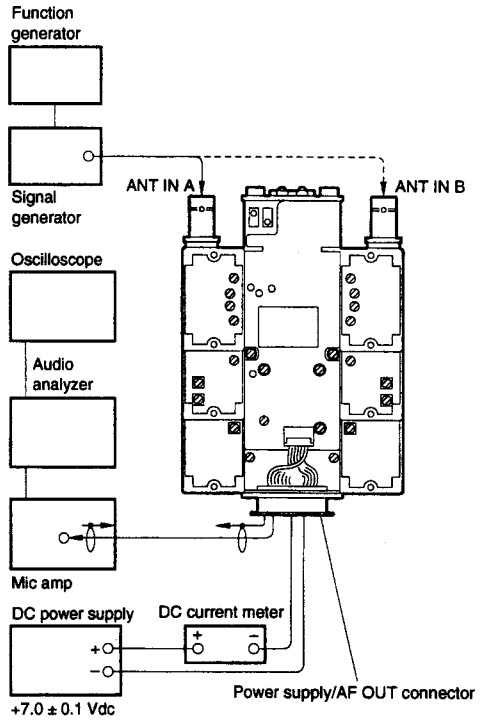
Adjustment is completed. (Nomal operation mode)

5. FM Detector Adjustment

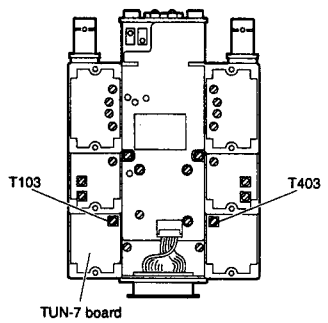
Equipment and Tools

- DC power supply: + 7.0±0.1 Vdc
- Signal generator
- Audio analyzer (Level meter, distortion meter)
- MIC amp (Noise meter)
- Oscilloscope
- Adjuster (0.4×1.3 mm) : 1 (Part No. 7-221-652-81)
- Power supply/AF OUT connector
  (Refer to the "How to make power supply/AF OUT connector" on page 3-1.)

Connection



Adjustment Location



Switch and Control Setting

Channel setting:
U64 model; Group 00, 65-01 channel (776.125 MHz)
U66 model; Group 00, 67-01 channel (788.125 MHz)
U68 model; Group 00, 69-16 channel (802.000 MHz)
AU66 model; Group 00, 67-16 channel (801.125 MHz)

MUTING: OFF

Procedure

(1) Connect the Audio analyzer to the AF OUT (power supply/AF OUT connector) of D-sub 15 pin connector via the MIC amp.
(2) Connect the signal genarator to the ANT IN A connector, and set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency) :
U64 model; 776.125 MHz
U66 model; 788.125 MHz
U68 model; 802.000 MHz
AU66 model; 801.125 MHz

RF OUTPUT (Output level): 60 dBμV_{EMF}
(= –53 dBm)
MODULATION : 1 kHz
DEVIATION : ±40 kHz

ANT IN A side Adjustment
(3) Adjustment
Specification : AF output level = Maximum
Adjustment : ⊘T103/TUN-7 board
(4) Set the audio analyzer to distortion meter mode.
(5) Adjustment
Specification : Distortion ratio = Minimum
(0.8 % or less)
Adjustment : ⊘T103/TUN-7 board
Adjust ⊘T103 finely.

ANT IN B side Adjustment
(6) Connect the signal generator to the ANT IN B connector. (Set the same setting as procedure (1) above for spectrum analyzer).
(7) Perform the procedures (2) , (3) and (4) above,
Adjustment : ⊘T403/TUN-7 board
Adjust ⊘T403 finely.

6. Output Level Adjustment

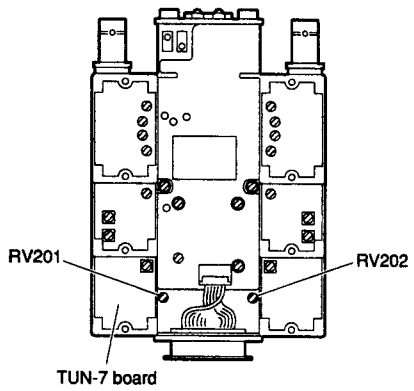
Equipment and Tools

- DC power supply: + 7.0±0.1 Vdc
- Audio analyzer (level meter, distortion meter)
- MIC amp (Noise meter)
- Oscilloscope
- Adjuster (0.4×1.3 mm) : 1 (Part No. 7-221-652-81)
- Power supply/AF OUT connector
  (Refer to the "How to make power supply/AF OUT connector" on page 3-1.)

Connection

Same as "5. FM Detector Adjustment".

Adjustment Location



Switch and Control Setting

Channel setting:
U64 model; Group 00, 65-01 channel (776.125 MHz)
U66 model; Group 00, 67-01 channel (788.125 MHz)
U68 model; Group 00, 69-16 channel (802.000 MHz)
AU66 model; Group 00, 67-16 channel (801.125 MHz)

MUTING: OFF

Procedure

(1) Connect the audio analyzer to the AF OUT (power supply/AF OUT connector) of D-sub 15 pin connector via the MIC amp.
(2) Connect the signal genarator to the ANT IN A connector, and set the Signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency) :
U64 model; 776.125 MHz
U66 model; 788.125 MHz
U68 model; 802.000 MHz
AU66 model; 801.125 MHz

RF OUTPUT (output level) : 60 dBμV_{EMF}
(= –53 dBm)
MODULATION : 1 kHz
DEVIATION : ±5 kHz
(3) Adjustment (ANT IN A side adjustment)
Specification : Output level
(level meter indication level) =
–40 dBm±0.2 dB (600 Ω loaded)
Adjustment : ⊘RV201/TUN-7 board
(4) Connect the signal generator to the ANT IN B connector.
(5) Adjustment (ANT IN B side adjustment)
Specification : Output level
(level meter indication level) =
–40 dBm ± 0.2 dB (600 Ω loaded)
Adjustment : ⊘RV202/TUN-7 board

Note
The output level difference between the ANT IN A side and the ANT IN B side should be within 0.3 dB.

7. S/N Check

Equipment and Tools

- DC power supply: + 7.0±0.1 Vdc
- Audio analyzer (level meter, distortion meter)
- MIC amp (Noise meter) with A-weighted filter
- Oscilloscope
- Adjuster (0.4×1.3 mm) : 1 (Part No. 7-221-652-81)
- Power supply/AF OUT connector
  (Refer to the "How to make power supply/AF OUT connector" on page 3-1.)

Connection

Same as "5. FM Detector Adjustment".

Switch and Control Setting

Channel setting:
U64 model; Group 00, 65-01 channel (776.125 MHz)
U66 model; Group 00, 67-01 channel (788.125 MHz)
U68 model; Group 00, 69-16 channel (802.000 MHz)
AU66 model; Group 00, 67-16 channel (801.125 MHz)

MUTING: OFF

Procedure

(1) Connect the audio analyzer to the AF OUT (power supply/AF OUT connector) of D-sub 15 pin connector via the MIC amp.

ANT IN A side adjustment

(2) Connect the signal genarator to the ANT IN A connector, and set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency) :
U64 model; 776.125 MHz
U66 model; 788.125 MHz
U68 model; 802.000 MHz
AU66 model; 801.125 MHz

RF OUTPUT (Output level): 60 dBμVEMF
(= –53 dBm)
MODULATION : ±1 kHz
DEVIATION : ±5 kHz

(3) Read the AF OUT level (Indicaton level of the Audio analyzer) . This level is specified to be 0 dB.
(4) Set the MODULATION of the signal generator to the OFF (No modulation) .
(5) Check that the indication level of the audio analyzer is –61 dB or less (S/N: 61 dB or more with A-weighted filter) as compared with level of procedure (3) above.
(6) Change the RF OUTPUT (output level) of the signal generator as shown below.
RF OUTPUT : 10 dBμVEMF (= –103 dBm)
(7) Check that indication level of the Audio analyzer (level meter mode) is –38 dB or less (S/N: 38 dB or more with A-weighted filter) as compared with level of procedure (3) above.
(8) Change the RF OUTPUT and MODULATION of the signal generator as shown below.
MODULATION : ON (modulation frequency=1 kHz).
RF OUTPUT : 60 dBμVEMF (= –53 dBm)
(9) Set the audio analyzer to the distortion meter mode.
(10) Check that the distortion ratio is –40 dB or less (1 % or less with A-weighted filter).

ANT IN B side check

(11) Connect the signal generator to the ANT IN B connector.
(12) Perform the procedures (3) through (10) above for ANT IN B side.

Note

When checking the S/N at 10 dBμV input, note the ANT IN (A or B) connector which shows the better S/N. Use the ANT IN (A or B) connector which shows the better S/N for adjustment under "8. Noise Squelch Adjustment".

8. Noise Squelch Adjustment

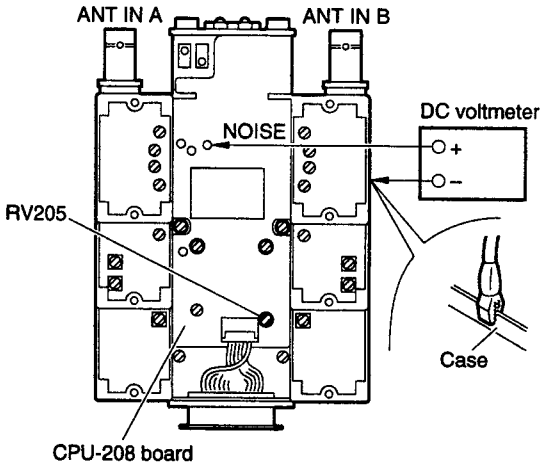
Equipment and Tools

- DC power supply: + 7.0±0.1 Vdc
- Signal generator
- DC voltmeter (digital multi meter)
- Audio analyzer
- Adjuster (0.4×1.3 mm) : 1 (Part No. 7-221-652-81)
- Power supply/AF OUT connector
  (Refer to the "How to make power supply/AF OUT connector" on page 3-1.)

Connection

Same as "5. FM Detector Adjustment".

Adjustment Location



Switch and Control Setting

Channel setting:
U64 model; Group 00, 65-01 channel (776.125 MHz)
U66 model; Group 00, 67-01 channel (788.125 MHz)
U68 model; Group 00, 69-16 channel (802.000 MHz)
AU66 model; Group 00, 67-16 channel (801.125 MHz)

MUTING: OFF

Procedure

(1) Connect the signal generator to the ANT IN (A or B) connector which showed the better S/N at the input of 10 dBμVEMF (= −103 dBm) under "7. S/N Check".
Set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency) :
U64 model; 776.125 MHz
U66 model; 788.125 MHz
U68 model; 802.000 MHz
AU66 model; 801.125 MHz

RF OUTPUT (Output level): 5 dBμVEMF
(= −108 dBm)
MODULATION (Modulation frequency) : 1 kHz
DEVIATION (Frequency deviation) : ±5 kHz

(2) Check that the 1 kHz waveform can be distinguished from the waveforms monitered on the oscilloscope.
(3) Turn ⊘RV205/TUN-7 board fully counterclockwise.
(4) Adjustment
Specificaton : DC voltage of NOISE terminal (land)/CPU-208 board changes from "H" (about 4.8 Vdc) to "L" (about 0 V) level.
Adjustment : ⊘RV205/TUN-7 board
Turn ⊘RV205 slowly clockwise for adjustment.

9. Tone Squelch Check

Equipment and Tools

- DC power supply: + 7.0±0.1 Vdc
- Signal generator
- Function generator
- DC voltmeter
- Power supply/AF OUT connector
  (Refer to the "How to make power supply/AF OUT connector" on page 3-1.)

Connection

Same as "5. FM Detector Adjustment".

Switch and Control Setting

Channel setting:
U64 model; Group 00, 65-01 channel (776.125 MHz)
U66 model; Group 00, 67-01 channel (788.125 MHz)
U68 model; Group 00, 69-16 channel (802.000 MHz)
AU66 model; Group 00, 67-16 channel (801.125 MHz)

MUTING: OFF

Procedure

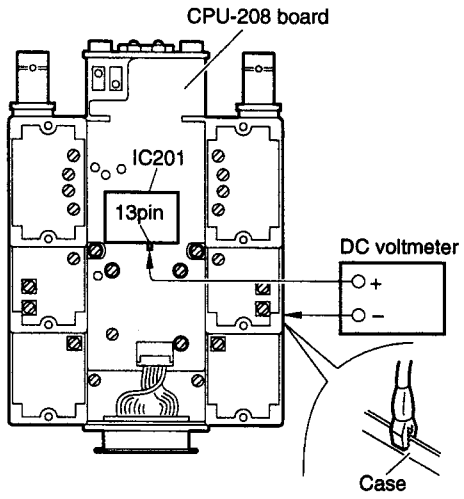
Step1: Adjustment

(1) Connect the signal generator to the ANT IN A connector, and set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency) :
U64 model; 776.125 MHz
U66 model; 788.125 MHz
U68 model; 802.000 MHz
AU66 model; 801.125 MHz

RF OUTPUT (Output level): 60 dBμVEMF
(= –53 dBm)
MODULATION (Modulation frequency): 32.768 kHz
(32.768 kHz must be set by connecting Function generator.)
DEVIATION (Frequency deviation): ±1.4 kHz

(2) Turn on and off the MODULATION (modulation frequency) of the signal generator as follows, and check that the voltage at the IC201-13 pin (TONE) of the CPU-208 board changes also as follows:

MODULATION of signal genarator	IC201-13 pin/ CPU-208 board voltage
ON	0 V
OFF	About 4.8 V



(3) Connect the signal generator to the ANT IN B connector, and perform the procedures (1) and (2) above.

Step2: Works after completing adjustment
After completing adjustment ("3-2-1. TUN-7 Board Adjustment"), turn off the main power of the WRR-855A and perform the following work then proceed to "3-2-2. Overall Characteristics Check" .
① Attach the T case lid (A) of the unit assembly.
② Attach the front panel and case.

3-2-2. Overall Characteristic Confirmation

Check the overall characteristics by following the procedure below.
When checking the system, the system must be repackaged in the normal operating condition (the case and front panel are attached) and the check must be performed by following procedure below.

Note

When checking the overall characteristics after completing "3-2-1. TUN-7 Board Adjustment" , perform the "Step2 Works after completing adjustment" on page 3-13.

Procedure

1. Current Consumption Check
   ↓
2. S/N Check
   ↓
3. Frequency Characteristic Check
   ↓
4. Distortion Ratio Check
   ↓
5. RF Level Indicator Check
   ↓
6. AF Level Indicator Check

Equipment and Tools

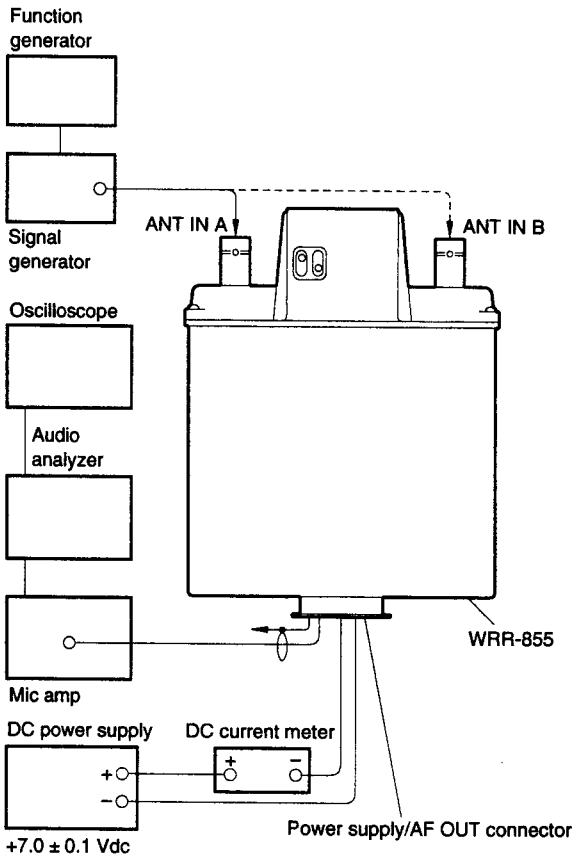
- DC power supply: + 7.0±0.1 Vdc
- Signal generator
- Audio analyzer
- MIC amp (Noise meter) with A-weighted filter
- Oscilloscope
- DC current meter
- Power supply/AF OUT connector
  (Refer to the "How to make power supply/AF OUT connector" on page 3-1.)

Switch and Control Setting

Channel setting:
- U64 model; Group 00, 65-01 channel (776.125 MHz)
- U66 model; Group 00, 67-01 channel (788.125 MHz)
- U68 model; Group 00, 69-16 channel (802.000 MHz)
- AU66 model; Group 00, 67-16 channel (801.125 MHz)

MUTING: OFF

Connection



1. Current Consumption Check

(1) Set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency) :
- U64 model; 776.125 MHz
- U66 model; 788.125 MHz
- U68 model; 802.000 MHz
- AU66 model; 801.125 MHz

RF OUTPUT (Output level): 60 dBμV_{EMF}
(= −53 dBm)
MODULATION (Modulation frequency): 1 kHz
DEVIATION (Frequency deviation) : ±5 kHz

(2) Check that the current consumption (DC current meter indication) is less than 190 mA.

2. S/N Check

Step1: Switch and control setting

Channel setting:

U64 model; Group 00, 64-01 channel (770.125 MHz)
U66 model; Group 00, 66-01 channel (782.125 MHz)
U68 model; Group 00, 68-01 channel (794.125 MHz)
AU66 model; Group 00, 66-01 channel (792.250 MHz)

MUTING: OFF

Step2: Set the signal generator as follows:

Signal generator setting
FREQUENCY (Carrier frequency) :
U64 model; 770.125 MHz
U66 model; 782.125 MHz
U68 model; 794.125 MHz
AU66 model; 792.250 MHz

RF OUTPUT (Output level): 60 dBμV_{EMF}
(= –53 dBm)
MODULATION (Modulation frequency): 1 kHz
DEVIATION (Frequency deviation): ±5 kHz

Step3: Checking

(1) Connect the audio analyzer to the AF OUT (power supply/AF OUTPUT connector) of the D-sub 15 pin connector via MIC amp.
(2) Connect the signal generator to the ANT IN A connector.
(3) Read the output level of the AF OUT (Audio analyzer indication level). This level is specified to be 0 dB.
(4) Turn OFF the MODULATION (modulation frequency) of the signal generator. (No modulation)
(5) Check that the output level of the AF OUT is –61 dB or less (S/N is 61 dB or more with A-weighted filter) as compared with the level of procedure (3) above.
(6) Change the RF OUTPUT (output level) of the signal generator as shown below.
RF OUTPUT: 10 dBμV_{EMF} (= –103 dBm)
(7) Check that the output level of the AF OUT is –38 dB or less (S/N is 38 dB or more with A-weighted filter) as compared with the level of procedure (3) above.
(8) Change the RF OUTPUT (output level) of the signal generator as shown below. (Same as setting of Step1)
RF OUTPUT: 60 dBμ (= –53 dBm)
(9) Set the audio analyzer to the distortion meter mode.
(10) Check that the distortion ratio is –40 dB or less (1 % or less).
(11) Connect the signal generator to the ANT IN B connector.
(12) Perform the procedures (3) through (10) above.
(13) Set the channel and FREQUENCY (carrier frequency) of the signal generator as shown ① and ② below. Perform the procedures (1) through (12) for each channel setting.

- U64 model
  ① Channel setting:
  Group 00, 65-01 channel (776.125 MHz)
  Signal generator setting:
  FREQENCY: 776.125 MHz
  ② Channel setting:
  Group 00, 65-47 channel (781.875 MHz)
  Signal generator setting:
  FREQENCY: 781.875 MHz

- U66 model
  ① Channel setting:
  Group 00, 67-01 channel (788.125 MHz)
  Signal generator setting:
  FREQENCY: 788.125 MHz
  ② Channel setting:
  Group 00, 67-47 channel (793.875 MHz)
  Signal generator setting:
  FREQENCY: 793.875 MHz

- U68 model
  ① Channel setting:
  Group 00, 69-01 channel (800.125 MHz)
  Signal generator setting:
  FREQENCY: 800.125 MHz
  ② Channel setting:
  Group 00, 69-47 channel (805.875 MHz)
  Signal generator setting:
  FREQENCY: 805.875 MHz

- AU66 model
  ① Channel setting:
  Group 00, 67-01 channel (799.250 MHz)
  Signal generator setting:
  FREQENCY: 799.250 MHz
  ② Channel setting:
  Group 00, 67-51 channel (805.500 MHz)
  Signal generator setting:
  FREQENCY: 805.500 MHz

3. Frequency Characteristic Check

Step1: Switch and control setting

Channel setting:

U64 model; Group 00, 65-01 channel (776.125 MHz)
U66 model; Group 00, 67-01 channel (788.125 MHz)
U68 model; Group 00, 69-16 channel (802.000 MHz)
AU66 model; Group 00, 67-16 channel (801.125 MHz)

MUTING: OFF

Step2: Checking

(1) Connect the audio analyzer (level meter) to the AF OUT (power supply/AF OUT connector) via MIC amp.
(2) Connect the signal generator to the ANT IN A connector, and set it as follows:

Signal generator setting

FREQUENCY (Carrier frequency):

U64 model; Group 00, 65-01 channel (776.125 MHz)
U66 model; Group 00, 67-01 channel (788.125 MHz)
U68 model; Group 00, 69-16 channel (802.000 MHz)
AU66 model; Group 00, 67-16 channel (801.125 MHz)

RF OUTPUT (Output level): 60 dBμVEMF
(= –53 dBm)
MODULATION (Mmodulation frequency): 1 kHz
DEVIATION (Frequency deviation): ±12 kHz

(3) Read the output level of the AF OUT (indication of the audio analyzer). This level is specified to be 0 dB.
(4) Change the MODULATION (modulation frequency) of the signal generator as follows, and check that the output level with respect to the output level under the procedure (2) is set also as follows.

Note

10 kHz and 15 kHz modulation frequency must be set by using the function generator.

Signal generator MODULATION frequency	AF output level
100 Hz	+ 1.0±1.0 dB
10 kHz	–20.0±1.5 dB
15 kHz	–26.5±2.5 dB

(5) Connect the signal generator to the ANT IN B connector, and perform the procedures (2), (3) and (4).

4. Distortion Ratio Check

Step 1: Switch and control setting

Channel setting:

U64 model; Group 00, 64-01 channel (770.125 MHz)
U66 model; Group 00, 66-01 channel (782.125 MHz)
U68 model; Group 00, 68-01 channel (794.125 MHz)
AU66 model; Group 00, 66-01 channel (792.250 MHz)

MUTING: OFF

Step2: Checking

(1) Connect the audio analyzer to the AF OUT (power supply/AF OUT connector) of the D-sub 15 pin connector via the MIC amp.
(2) Set the signal generator as follows:

Signal generator setting

FREQUENCY (Carrier frequency):

U64 model; 770.125 MHz
U66 model; 782.125 MHz
U68 model; 794.125 MHz
AU66 model; 792.250 MHz

RF OUTPUT (Output level) : 60 dBμVEMF
(= –53 dBm)
MODULATION (Modulation frequency): 1 kHz
DEVIATION (Frequency deviation): ±40 kHz

(3) Set the audio analyzer to the distortion meter mode, and check that the distortion is less than 0.8 %.
(4) Change the MODULATION (modulation frequency) of the signal as shown below.
MODULATION: 10 kHz
(10 kHz modulation frequency must be set by using the function generator.)
Check that the distortion ratio is less than 3 %.
(5) Connect the signal generator to the ANT IN B connector, and perform the procedures (2) through (4) above.
(6) Set the channel and FREQUENCY (carrier frequency) of the signal generator as shown ① and ② below. Perform the procedures (1) through (7) above, for each channel setting (① and ②).

- U64 model
  ① Channel setting:
  Group 00, 65-01 channel (776.125 MHz)
  Signal generator setting:
  FREQENCY: 776.125 MHz
  ② Channel setting:
  Group 00, 65-47 channel (781.875 MHz)
  Signal generator setting:
  FREQENCY: 781.875 MHz

- U66 model
  ① Channel setting:
  Group 00, 67-01 channel (788.125 MHz)
  Signal generator setting:
  FREQENCY: 788.125 MHz
  ② Channel setting:
  Group 00, 67-47 channel (793.875 MHz)
  Signal generator setting:
  FREQENCY: 793.875 MHz

- U68 model
  ① Channel setting:
  Group 00, 69-01 channel (800.125 MHz)
  Signal generator setting:
  FREQENCY: 800.125 MHz
  ② Channel setting:
  Group 00, 69-47 channel (805.875 MHz)
  Signal generator setting:
  FREQENCY: 805.875 MHz

- AU66 model
  ① Channel setting:
  Group 00, 67-01 channel (799.250 MHz)
  Signal generator setting:
  FREQENCY: 799.250 MHz
  ② Channel setting:
  Group 00, 67-51 channel (805.500 MHz)
  Signal generator setting:
  FREQENCY: 805.500 MHz

5. RF Input Level Indicator Check

Step 1: Switch and control setting
Channel setting:
U64 model; Group 00, 64-01 channel (770.125 MHz)
U66 model; Group 00, 66-01 channel (782.125 MHz)
U68 model; Group 00, 65-01 channel (794.125 MHz)
AU66 model; Group 00, 66-01 channel (792.250 MHz)

MUTING: OFF

Step2: Checking
(1) Connect the signal generator to the ANT IN A connector, and setthe signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency) :
U64 model; 770.125 MHz
U66 model; 782.125 MHz
U68 model; 794.125 MHz
AU66 model; 792.250 MHz

RF OUTPUT (Output level): 0 dBμV_{EMF}
(= −113 dBm)
MODULATION (Modulation frequency) : 1 kHz
DEVIATION (Frequency deviation) : ±5 kHz

(2) Increase gradually the output level from the signal generator, and check that the output level of the signal generator is as follows when the RF input level indicator lights.

RF input level indicator	Output level of Signal indicator
Light in red.	10 dBμV_{EMF}±3 dB
Light in green.	25 dBμV_{EMF}±3 dB

(3) Connect the signal generator to the ANT IN B connector, and perform the checking of procedure (2) above.
(4) Set the channel setting and FREQUENCY (carrier frequency) of the signal generator as shown ① and ② below. Perform the procedures (1) through (3) above, for each channel setting (① and ②).

- U64 model
  ① Channel setting:
  Group 00, 65-01 channel (776.125 MHz)
  Signal generator setting:
  FREQENCY: 776.125 MHz
  ② Channel setting:
  Group 00, 65-47 channel (781.875 MHz)
  Signal generator setting:
  FREQENCY: 781.875 MHz

- U66 model
  ① Channel setting:
  Group 00, 67-01 channel (788.125 MHz)
  Signal generator setting:
  FREQENCY: 788.125 MHz
  ② Channel setting:
  Group 00, 67-47 channel (793.875 MHz)
  Signal generator setting:
  FREQENCY: 793.875 MHz

- U68 model
  ① Channel setting:
  Group 00, 69-01 channel (800.125 MHz)
  Signal generator setting:
  FREQENCY: 800.125 MHz
  ② Channel setting:
  Group 00, 69-47 channel (805.875 MHz)
  Signal generator setting:
  FREQENCY: 805.875 MHz

- AU66 model
  ① Channel setting:
  Group 00, 67-01 channel (799.250 MHz)
  Signal generator setting:
  FREQENCY: 799.250 MHz
  ② Channel setting:
  Group 00, 67-51 channel (805.500 MHz)
  Signal generator setting:
  FREQENCY: 805.500 MHz

6. AF Indicator Check

Step 1: Switch and control setting
Channel setting:
U64 model; Group 00, 65-01 channel (776.125 MHz)
U66 model; Group 00, 67-01 channel (788.125 MHz)
U68 model; Group 00, 69-16 channel (802.000 MHz)
AU66 model; Group 00, 67-16 channel (801.125 MHz)

MUTING: OFF

Step2: Connect the signal generator to the ANT IN A connector, and set the signal generator as follows:
Signal generator setting
FREQUENCY (Carrier frequency):
U64 model; 776.125 MHz
U66 model; 788.125 MHz
U68 model; 802.000 MHz
AU66 model; 801.125 MHz

RF OUTPUT (Output level): 60 dBμV_{EMF}
(= –53 dBm)
MODULATION (Modulation frequency): 1 kHz

(2) Increase gradually DEVIATION (frequency deviation) of the sigal generator starting from ±3.0 kHz, and check that the deviation of the signal generator is ±(5.0±1.2) kHz with the AF indicator as follows.
AF indicator: Light in green
(3) Connect the signal generator to the ANT IN B connector, perform the procedure (2) above.

Section 4
Semiconductor Pin Assignments

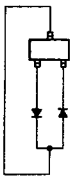
Semiconductors of which functions are equivalent are described here. For parts replacement, refer to the spare parts section. The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

DIODE	PAGE
1SS295	4-2
1SS302	4-2
MA132WK	4-2
MA133	4-2
SLP-124B	4-2
SLP520D	4-2

TRANSISTOR	PAGE
2SB1121	4-2
2SC2351	4-2
2SC3606	4-2
2SC4738	4-2
2SD2216	4-2
2SJ132	4-2
3SK177	4-2
3SK245	4-2
RN1104	4-2
UN9213	4-2
XN6501	4-2
XP4601	4-2

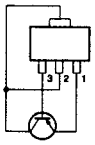
IC	PAGE
M5237ML	4-2
MAX242CWN	4-2
MAX242EWN	4-2
MB1512PFV	4-3
MB3773PF	4-3
NE575DK	4-3
NJM2406F	4-3
RH5RE50AA	4-4
SA575DK-T	4-4
ST93C46TM6	4-4
TA31161FN	4-4
TA75S01F	4-4
TA75S393F	4-4
TA75S558F	4-4
TA8122AF	4-4
TC4SU69F	4-5
TC4W53FU	4-5
TC74HC4053AFT	4-5
TC75S51F	4-5
TC7S08FU	4-5
TC7S86FU	4-5
TC7SU04FU	4-5

(SCALE 4/1)
TOP VIEW



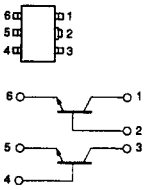
1SS295
1SS302
MA133

(SCALE 4/1)
TOP VIEW



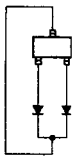
2SB1121

(SCALE 6/1)
TOP VIEW

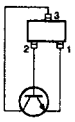


XN6501

(SCALE 4/1)
TOP VIEW

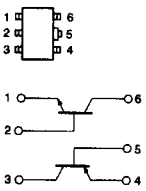


MA132WK

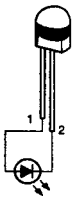


2SC2351

(SCALE 6/1)
TOP VIEW

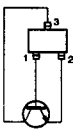


XP4601



SLP-124B

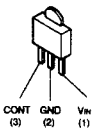
(SCALE 4/1)
TOP VIEW

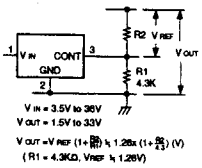


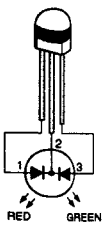
2SC3606
2SC4738
2SD2216

M5237ML (MITSUBISHI)

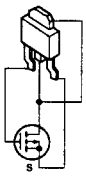
ADJUSTABLE VOLTAGE REGULATOR







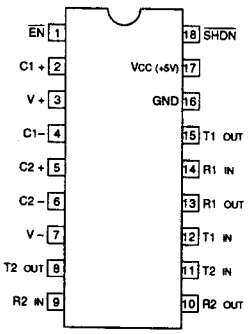
SLP520D

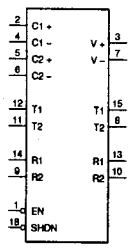


2SJ132

MAX242CWN (MAXIM) FLAT PACKAGE
MAX242EWN (MAXIM) FLAT PACKAGE

RS-232C TRANSMITTER/RECEIVER
—TOP VIEW—





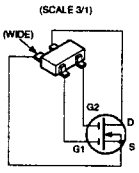
INPUT

$\overline{EN}$	; RECEIVER ENABLE
$\overline{SHDN}$	; SHUT DOWN
R1, R2	; RECEIVER1, 2
T1, T2	; TRANSMITTER1, 2

OUTPUT

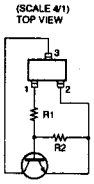
R1,R2	; RECIEVER1, 2
T1, T2	; TRANSMITTER1, 2

(SCALE 3/1)

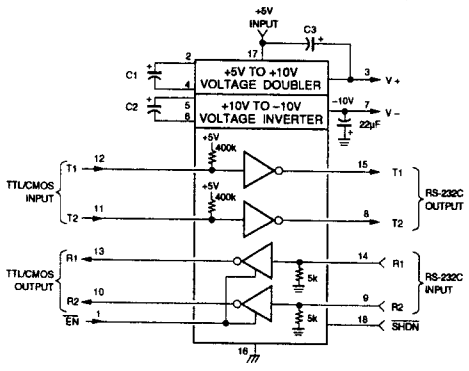


3SK177
3SK245

(SCALE 4/1)
TOP VIEW

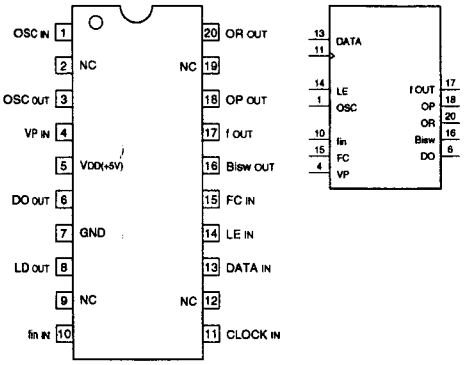


RN1104
UN9213



MB1512PFV (FUJITSU)

C-MOS PLL FREQUENCY SYNTHESIZER
—TOP VIEW—



INPUT

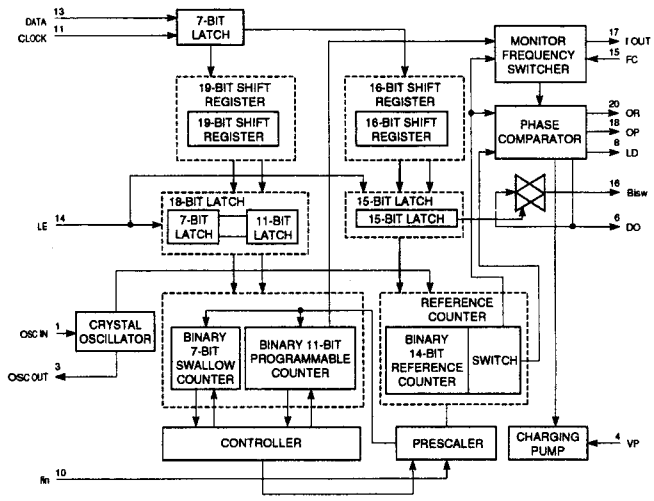
CLOCK	;	CLOCK INPUT FOR 19-BIT SHIFT REGISTER AND 16-BIT SHIFT REGISTER
DATA	;	SERIAL DATA INPUT (BINARY CODE)
FC	;	SWITCHES PHASE OF PHASE COMPARATOR
FIN	;	PRE-SCALER INPUT
LE	;	LOAD ENABLE SIGNAL INPUT
OSCIN	;	CONNECTED TO CRYSTAL OSCILLATOR (REFERENCE FREQUENY DIVIDER INPUT)
VP	;	POWER SOURCE FOR CHARGING PUMP OUTPUT

OUTPUT

BISW	;	ANALOG SWITCH OUTPUT, NORMALLY IN HIGH IMPEDANCE
DO	;	BUILT-IN CHARGING PUMP OUTPUT
FOUT	;	MONITOR FOR PHASE COMPARATOR INPUT

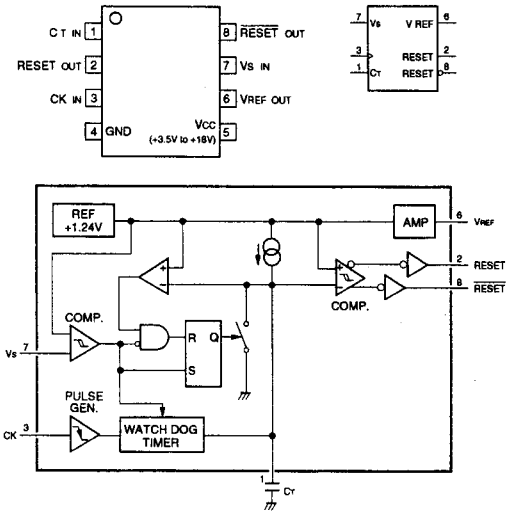
FC	OUTPUT SIGNAL
H	REFERENCE FREQUENCY DIVIDER
L	COMPARISON FREQUENCY DIVDER

LD	;	PHASE COMPARATOR OUTPUT
OSCOUT	;	CONNECTED TO CRYSTAL OSCILLATOR
ϕP AND ϕR	;	OUTPUT FOR PHASE COMPARATOR EXTERNAL CHARGING PUMP



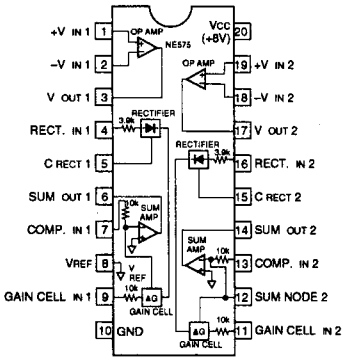
MB3773PF (FUJITSU) FLAT PACKAGE

BIPOLAR SOURCE VOLTAGE SUPERVISOR
—TOP VIEW—



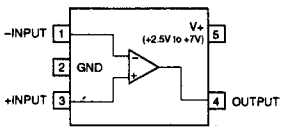
NE575DK (SIGNETICS)
SA575DK-T (PHILIPS)

LOW VOLTAGE COMPANDOR
—TOP VIEW—



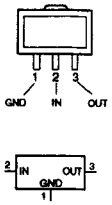
NJM2406F (JRC) FLAT PACKAGE

SINGLE COMPARATOR
—TOP VIEW—



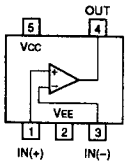
RH5RE50AA (RICOH) +5.0V

THREE TERMINAL POSITIVE VOLTAGE REGULATOR
—TOP VIEW—



TA75S01F (TOSHIBA)
TA75S558F (TOSHIBA)

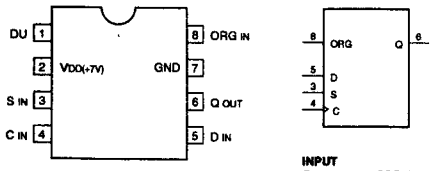
SINGLE OPERATIONAL AMPLIFIER
—TOP VIEW—



TYPE	SUPPLY VOLTAGE
75S01F	±1.5V to ±6V +3V to +12V
75S558F	±4V to ±18V

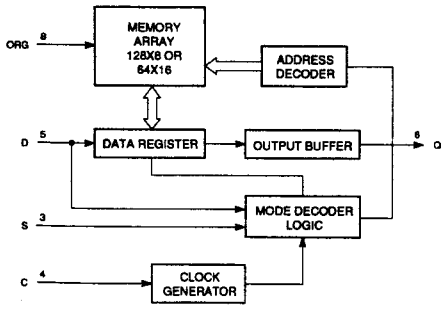
ST93C46TM6 (SGS-THOMSON MICRO ELECTRONICS)

C-MOS 1K (64×16 OR 128×8)-BIT EEPROM
—TOP VIEW—



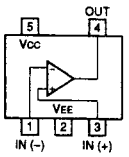
INPUT
C ; SERIAL CLOCK
D ; SERIAL DATA
ORG ; ORGANIZATION SELECT
S ; CHIP SELECT

OUTPUT
Q ; SERIAL DATA



TA75S393F (TOSHIBA)

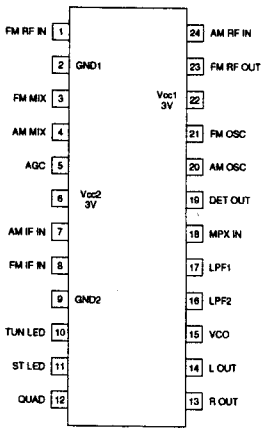
SINGLE COMPARATOR
— TOP VIEW —

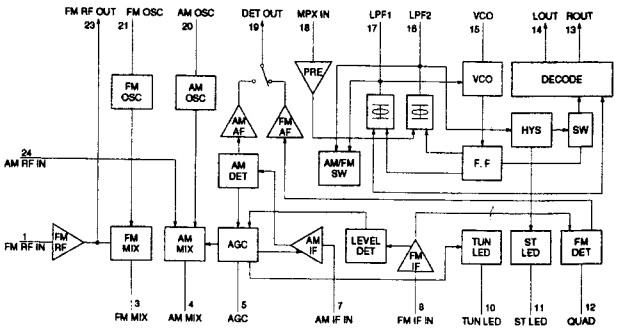


VCC ; +1 V to +18 V or +2 V to +36 V
VEE ; –1 V to –18 V

TA8122AF (TOSHIBA) FLAT PACKAGE

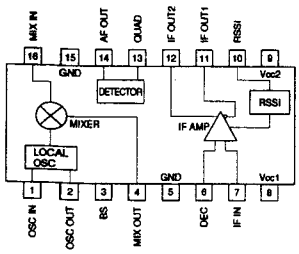
AM/FM TUNER
—TOP VIEW—





TA31161FN (TOSHIBA) FLAT PACKAGE

IF DETECTOR
—TOP VIEW—

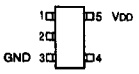


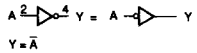
OSC IN, OUT : LOCAL OSC INPUT
BS : BATTERY SAVE
MIXER OUT : MIXER OUTPUT
DEC : BIAS FOR IF INPUT
IF IN : IF INPUT
RSSI : RSSI OUTPUT
IF OUT1, 2 : IF LIMITTER OUTPUT
QUAD : PHASE INPUT FOR FM DETECTOR
AF OUT : DEMODULATION SIGNAL OUTPUT
MIX IN : MIXER INPUT

TC4SU69F (TOSHIBA) CHIP PACKAGE
TC7SU04FU (TOSHIBA) CHIP PACKAGE

C-MOS INVERTER

(SCALE 6/1)
—TOP VIEW—





$Y = \overline{A}$

A	Y
0	1
1	0

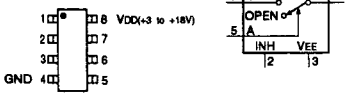
0 ; LOW LEVEL
1 ; HIGH LEVEL

TYPE	VDD
7S04F 7SU04F 7SU04FU	+2 to +6V
4S69F 4SU69F	+3 to +18V
7SH04FU	+2 to +5.5V

TC4W53FU (TOSHIBA) CHIP PACKAGE

C-MOS 2-CHANNEL MULTIPLEXER / DEMULTIPLEXER

(SCALE 3/1)
—TOP VIEW—

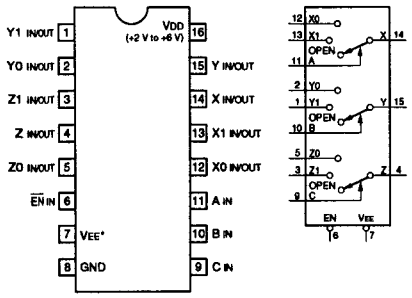


CONT. INPUT		ON CHANNEL
INH	A	
0	0	0
0	1	1
1	X	OPEN

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

TC74HC4053AFT (TOSHIBA) FLAT PACKAGE

C-MOS TRIPLE 2-CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —



VEE* : VDD - VEE = +3 V to +12 V
VEE ≤ GND

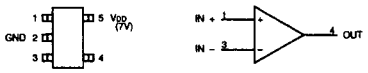
CONTROL INPUTS				ON CHANNEL		
EN	SELECT					
	C	B	A			
0	0	0	0	Z0	Y0	X0
0	0	0	1	Z0	Y0	X1
0	0	1	0	Z0	Y1	X0
0	0	1	1	Z0	Y1	X1
0	1	0	0	Z1	Y0	X0
0	1	0	1	Z1	Y0	X1
0	1	1	0	Z1	Y1	X0
0	1	1	1	Z1	Y1	X1
1	X	X	X	OPEN		

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

TC75S51F (TOSHIBA)

C-MOS OPERATIONAL AMPLIFIER

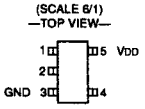
(SCALE 6/1)
TOP VIEW

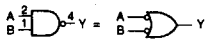


TC7S08FU (TOSHIBA) CHIP PACKAGE

C-MOS 2-INPUT AND GATE

(SCALE 6/1)
—TOP VIEW—





$Y = A \cdot B = \overline{\overline{A} + \overline{B}}$

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

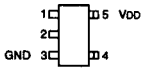
0 ; LOW LEVEL
1 ; HIGH LEVEL

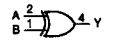
TYPE	VDD
7S08F 7S08FU	+2 to +6V
4S81F 14S81F	+3 to +18V
7SH08FU	-2 to +5.5V

TC7S86FU (TOSHIBA) CHIP PACKAGE

C-MOS 2-INPUT EXCLUSIVE OR GATE

(SCALE 6/1)
—TOP VIEW—





$Y = \overline{A} \cdot B + A \cdot \overline{B}$

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

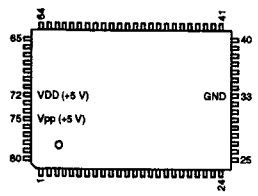
0 ; LOW LEVEL
1 ; HIGH LEVEL

TYPE	VDD
7S86FU 7S86F	+2 to +6V
4S30F	+3 to +18V

Pin description of CPU

CXP834P16Q-1-XXX

-TOP VIEW-



[Inputs]

Signal Name	Pin No.	Description
VDD	72	Power supply input (+5 Vdc)
Vpp	75	Power supply input (+5 Vdc) for PROM
Vss	33	GND for power supply
EXTAL	31	Clock input (8 MHz)
XTAL	32	Clock input (8 MHz: Phase-reversal of EXTAL)
VLC3	35	Bias voltage for LCD
VLC2	36	Bias voltage for LCD
VLC1	37	Bias voltage for LCD
ALO	22	Audio signal level (analog)
RSSI(A)	23	RF signal level of ANTENNA A input (analog)
RSSI(B)	24	RF signal level of ANTENNA B input (analog)
BAT0	26	Power supply voltage (analog)
BAT2	27	Power supply voltage for tuner circuit (analog)
DIST1	28	Selection 1 for destination (model type) (analog)
DIST2	29	Selection 2 for destination (model type) (analog)
TONE	13	Tone signal detection (L: detecting)
NOISE	14	Noise signal detection (L: detecting)
OPT1	15	Optional input (reserve)
PLL-LD	16	PLL lock detection (H: Lock)
CH	1	Operation button (CH) (L: ON)
LEVEL	2	Operation button (LEVEL) (L: ON)
+	18	Operation button (+) (L: ON)
–	19	Operation button (–) (L: ON)
SQL SET	21	RSSI learning mode setting (L: RSSI learning mode when POWER is on)
MUTE	79	MUTING ON/OFF switch (L: ON)
GP	80	Operation button (GP) (L: ON)
RST	30	Reset

[Outputs]

Signal Name	Pin No.	Description
COM0 to COM3	38 to 41	LCD control
SEG0 to SEG19	42 to 61	LCD control
VL	34	Bias voltage control for LCD
SHDN	3	Control for shut down of IC761 (L: shut down)
WDT	4	Watch dog timer
GAIN	5	Control for AF level changing
RFG	11	Control for RF LED (green)
AFR	12	Control for AF LED (red)
RFR	20	Control for RF LED (red)
DIV	66	Diversity control (H: ANT A, L: ANT B)
AFM	67	AF muting (H: Muting OFF)

[Inputs/Outputs for EEPROM and PLL]

Signal Name	Pin No.	Description
ROM-DO	17	EEPROM Control
ROM-CS	68	EEPROM Control
ROM-SK/PLL-CLK	69	EEPROM/PLL control
ROM-DI/PLL-DATA	70	EEPROM/PLL control
PLL-LE	77	PLL control

[Inputs/Outputs for communication]

Signal Name	Pin No.	Description
IF-CS	6	Serial I/O control
IF-CLK	7	Serial I/O control
IF-DI	8	Serial I/O control
IF-DO	9	Serial I/O control

[Others]

Signal Name	Pin No.	Description
PA3/AN5	25	NC
SEG20 to SEG23	62 to 65	NC
OPT3	71	Not used
OPT4	76	Not used
TX	73	NC
TEX	74	NC
PE0/INT0/EC	78	NC
PB5/SCK1	10	NC

Section 5
Block Diagrams

General Description

The WRR-855A consists of the following circuit boards:

Board Name	Quantity	Reference No.
TUN-7 board	1	100 to 400 and 600s
CPU-208 board	1	700 series
DP-236 board	1	800 series
SW-814 board	1	900 series

TUN-7 Board

The TUN-7 board is powered by the DC +7 V power supply and functions as the PLL synthesized diversity tuner which is controlled by the CPU-208 board. The TUN-7 board receives the RF signal input from the antenna A and antenna B, and outputs the demodulated audio signal. The TUN-7 board also supplies the RSSI signal and the DC-converted audio signal to the CPU-208 board. The TUN-7 board consists of the power supply block, RF block and the audio block.

The power supply block receives the DC +7 V power input which is supplied from the D-sub connector via CN602. The power supply block supplies DC +6 V (IC651) to the RF block and audio block from the voltage regulator IC651 and IC652. It supplies DC +5 V (IC652) to the 1st local circuit of the RF block.

The RF block consists of RF amplifier circuit, 1st mixer circuit, 2nd mixer circuit, IF circuit, FM detector circuit, 1st local circuit and 2nd local circuit. Two equivalent circuit of the RF amplifier circuit, 1st mixer circuit, 2nd mixer circuit, IF circuit and FM detector circuit are provided for antenna A (Ref. No. 100s) and for antenna B (Ref. No. 400s).

The RF signal which is input from the antenna A and antenna B are passed through band-pass filters (FL101, FL401), amplified by RF amplifiers (Q101, Q401), passed through band-pass filters (FL102 and FL402) and input to 1st mixer circuit. The RF signal is mixed with the 1st local signal in the 1st mixer circuit (Q102, Q103, Q402, Q403) where the input signal is converted to the 1st IF signal (150.75 MHz). The 1st IF signal is mixed with the 2nd local signal at the 2nd mixer circuit (Q104, Q105, Q404, Q405) where the 1st IF signal is converted to the 2nd IF signal (10.7 MHz). The 2nd IF signal is detected by the FM detector IC (IC102, IC402) which outputs audio (AF) signal. The audio signal is sent to the audio block. The 2nd IF signal is converted to the RSSI signal by the IF amplifier (IC101, IC401) and is output to the CPU-208 board. The 1st local signal is generated by controlling the VCO (CP301) with the PLL IC (IC301). The 2nd local signal is generated by the crystal oscillator (CP302).

The audio block consists of the tone signal detector circuit, noise signal detector circuit, diversity switching circuit, muting circuit, de-emphasis circuit, expander circuit and audio amplifier circuit. The FM detector outputs (audio outputs AF (A) and (B)) of the RF block are amplified by the AF amplifier (A) (IC201) and AF amplifier (B) (IC202) and is sent to the diversity switching circuit (IC203-1/3). The diversity switching is controlled by the DIV signal from the CPU-208 board. The audio output signal from the diversity switching circuit is passed through the muting circuit (IC203-2/3), de-emphasis circuit (IC204), low-pass filter circuit (IC205) and expander circuit (IC206) then amplified by the AF amplifier (IC207) and feed the D-sub connector via CN602.

CPU-208 Board

The CPU-208 board consists of the CPU which performs the system control, and the system clock oscillator circuit. The CPU (IC701) controls the TUN-7 board, DP-236 board and SW-814 board.

The clock oscillator circuit (X751, CT751, IC751, IC752, etc.,) oscillates the 4 MHz clock which is fed to the tuner unit. The 4 MHz signal is multiplied (IC780) to generate 8 MHz signal which is supplied to the CPU. 4 MHz clock can be input to the WRR-855A from external source. If external clock is input, clock signal is switched from the internal clock to the external clock automatically by IC772, IC773, IC774, etc.

Connector CN761 is the connector for external interface which relays the serial I/O signals of the CPU (IC701) and external controller. IC761 shifts the level (TTL ↔ RS-232C) of external interface signal of the CPU.

DP-236 Board

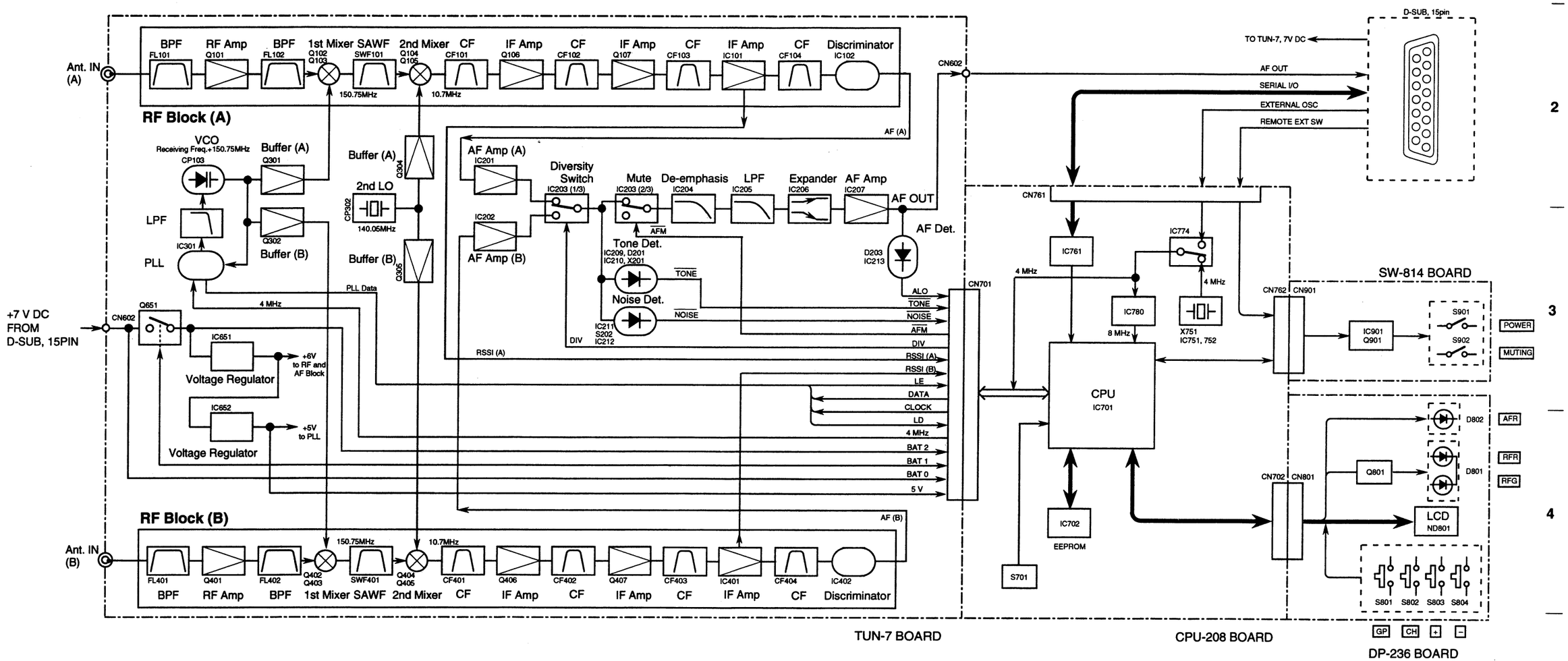
The DP-236 board consists of display block and operation control block.

The dipslay block has the LCD (ND801) which indicates the various status of groups and channels, and the RF indicator (D801) and the AF indicator (D802) which indicates status of RF input and audio input. The operation control block consists of the switches (S801 to S804) which perform the various settings such as group setting and channel setting. When these switches are operated, the various settings are performed by the CPU on the CPU-208 board.

SW-814 Board

The SW-814 board has the POWER ON/OFF switch (S901) and the MUTING ON/OFF (S902) switch on it. IC901 and Q901 control ON and OFF of the external power supply.

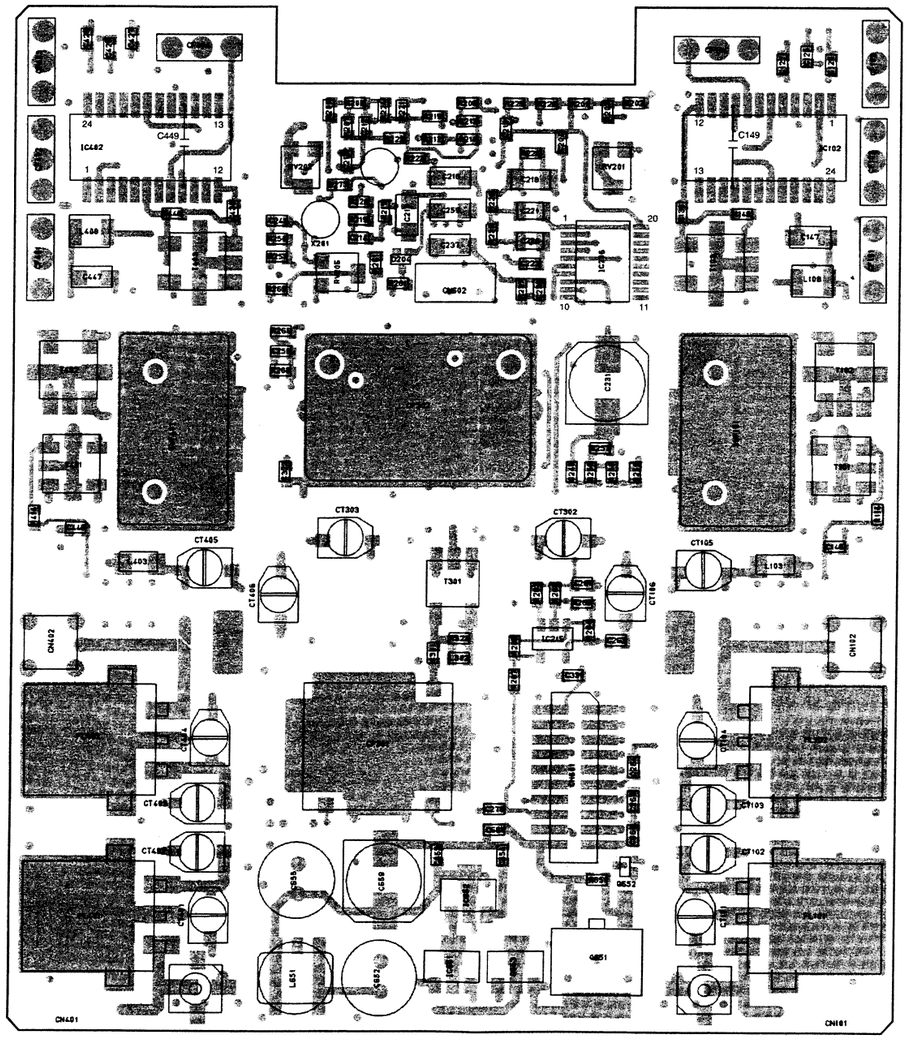
OVERALL



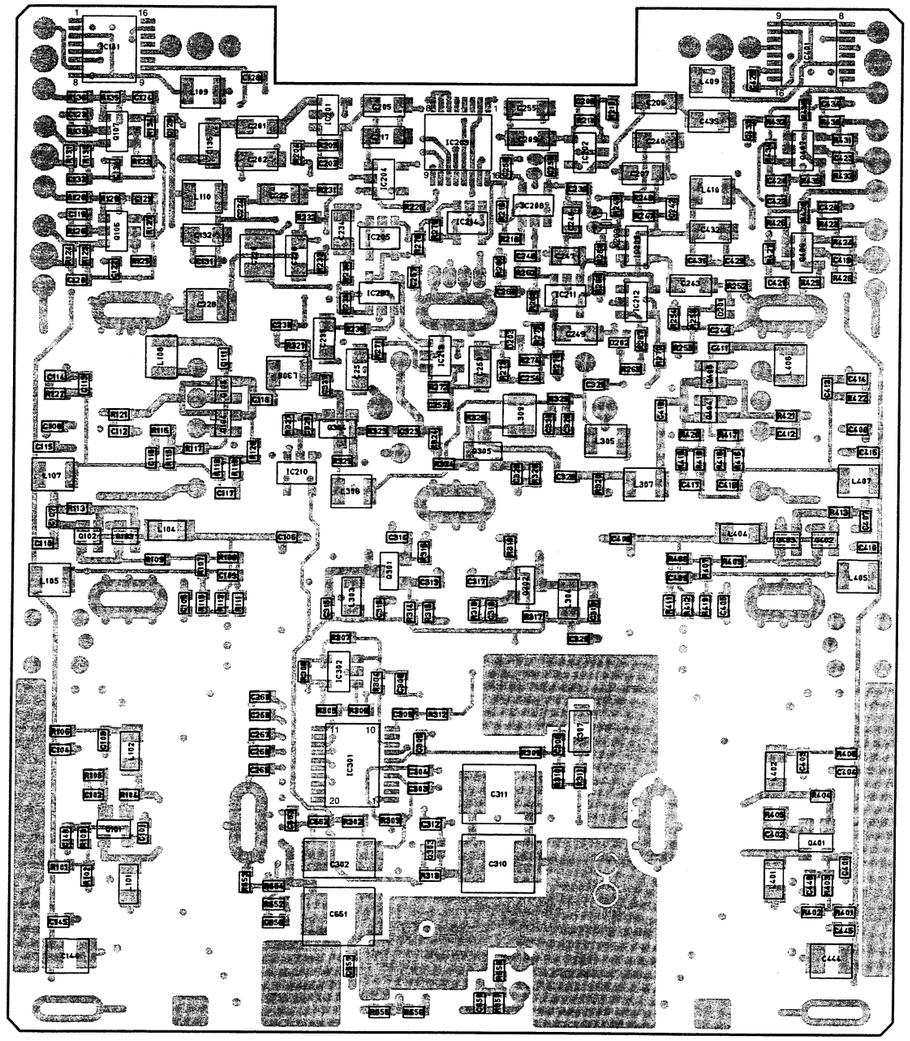
OVERALL

Section 6
Board Layouts and Schematic Diagrams

TUN-7



TUN-7 A SIDE
BOARD No. 1-657-744-11, -12, -13

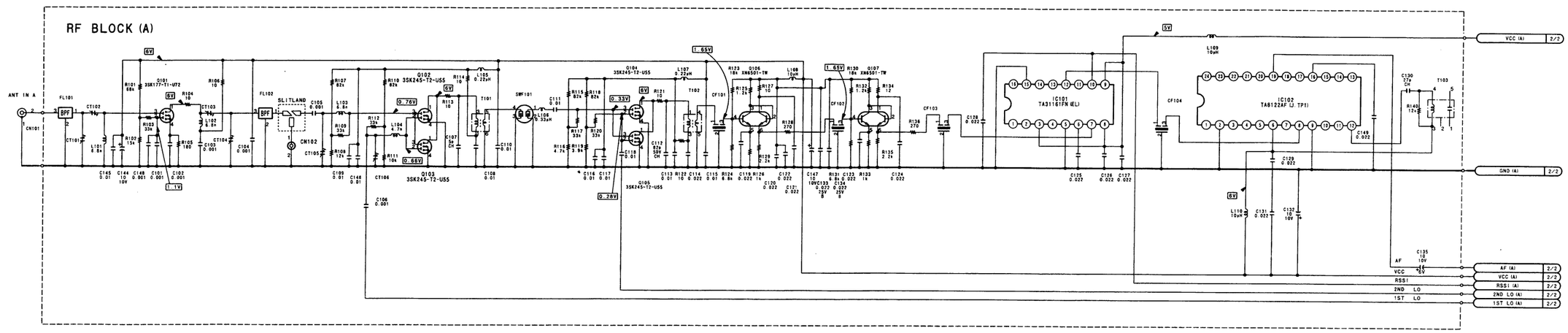


TUN-7 B SIDE
BOARD No. 1-657-744-11, -12, -13

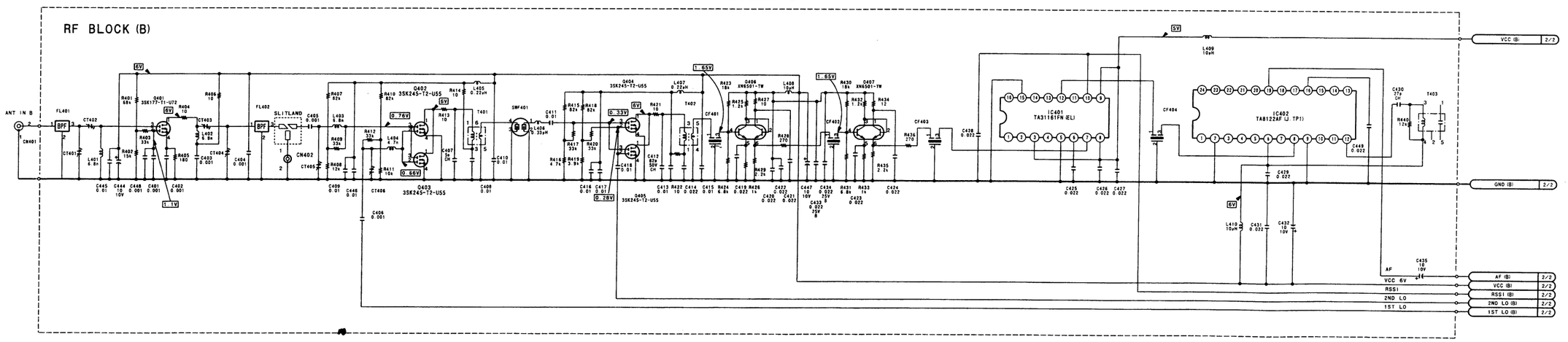
6-1

TUN-7 (1/2)

ANTENNA A



ANTENNA B



TUN-7 BOARD (1/2)

BOARD NO. 1-657-744-11, -12, -13

B-WRR855/A-TUN7-S/M-01

Notes:

- DC voltage are taken with digital multimeter (input impedance 1 MΩ or more) under no-signal conditions.

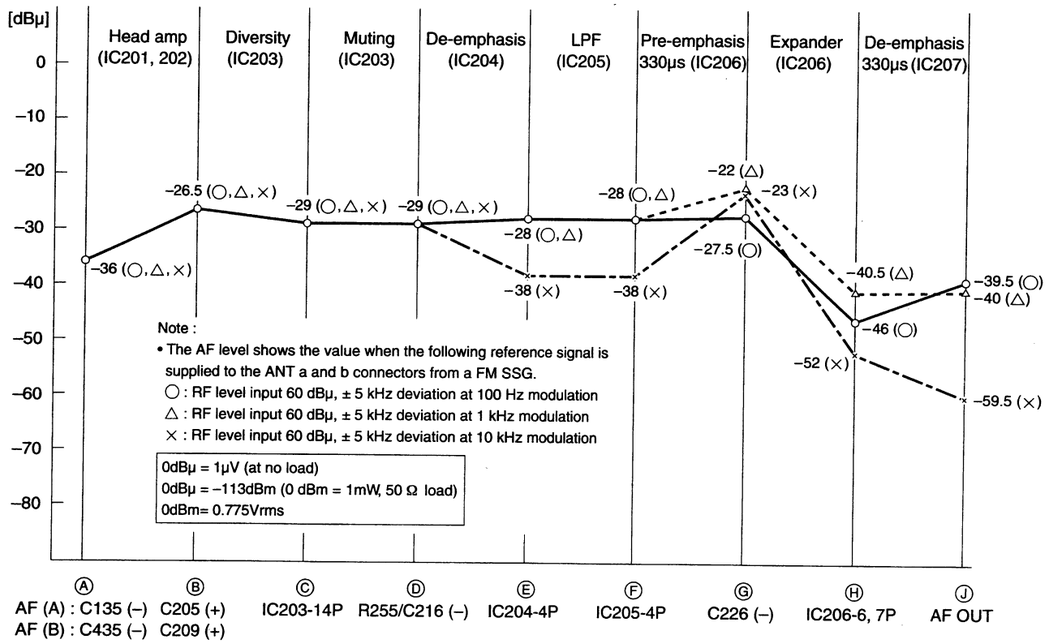
6-2 6-2

A | B | C | D | E | F | G | H

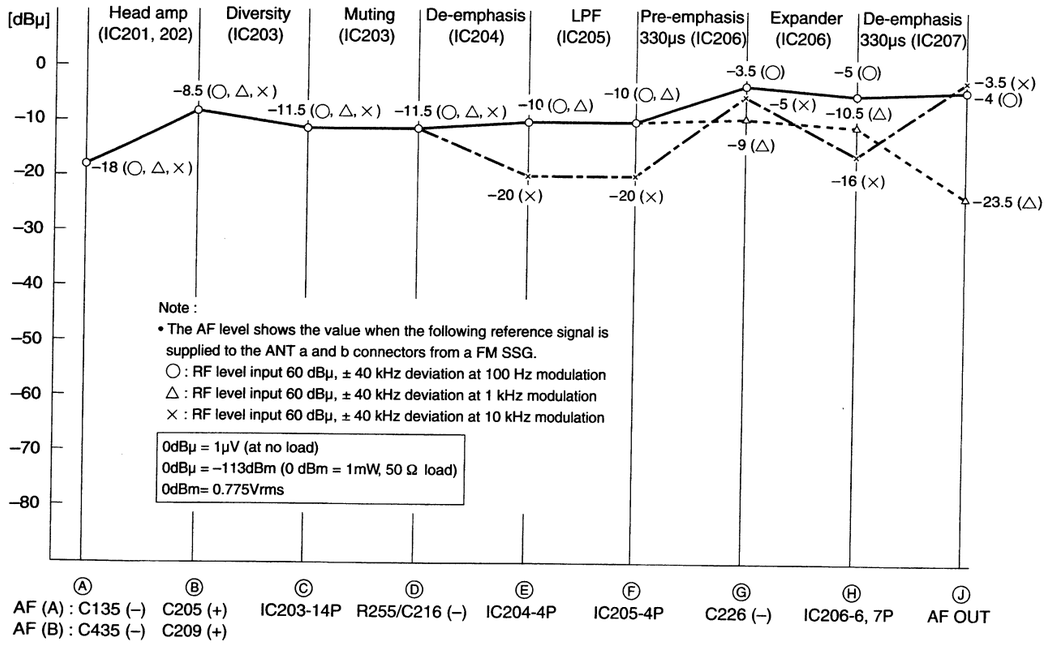
1 2 3 4 5

SONY-SP1007 / DRUCK 3

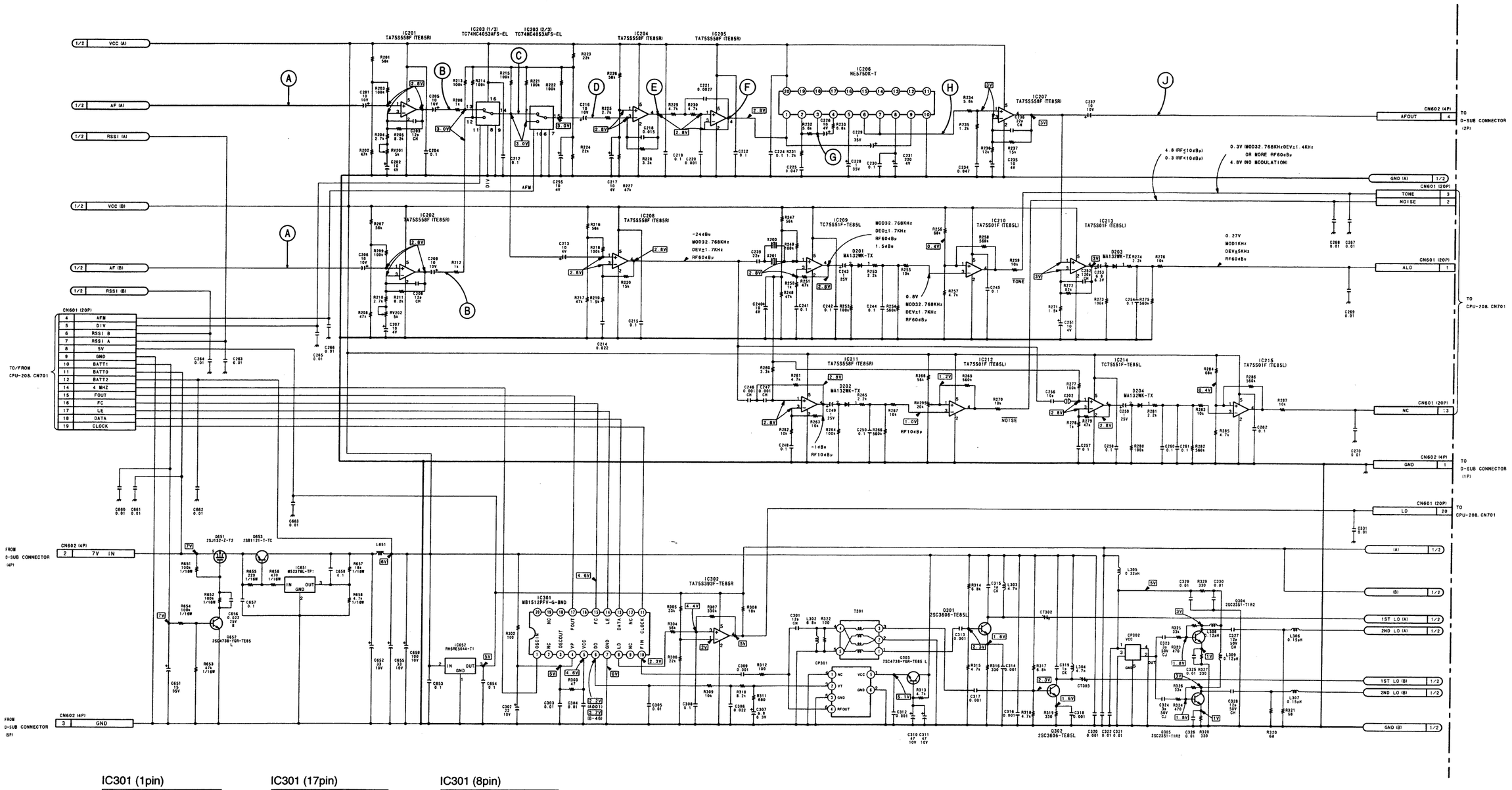
• AF level diagram ① (TUN-7 board)



• AF level diagram ② (TUN-7 board)



TUN-7 (2/2)



IC301 (1pin): 5V / 0V, 1V/DIV, 0.25μs, 0.1μs/DIV

IC301 (17pin): 5V / 0V, 1V/DIV, 8μs, 2μs/DIV

IC301 (8pin): 5V / 0V, 1V/DIV, 8μs, 2μs/DIV

Notes:

- The AF level shows the value when RF signal (60 dBμ at ±5 kHz deviation and 1 kHz modulation frequency) is inputted into ANTENNA A IN connector.
- DC voltage are taken with digital multimeter (input impedance 1 MΩ or more) under no-signal conditions.

TUN-7 BOARD (2/2)

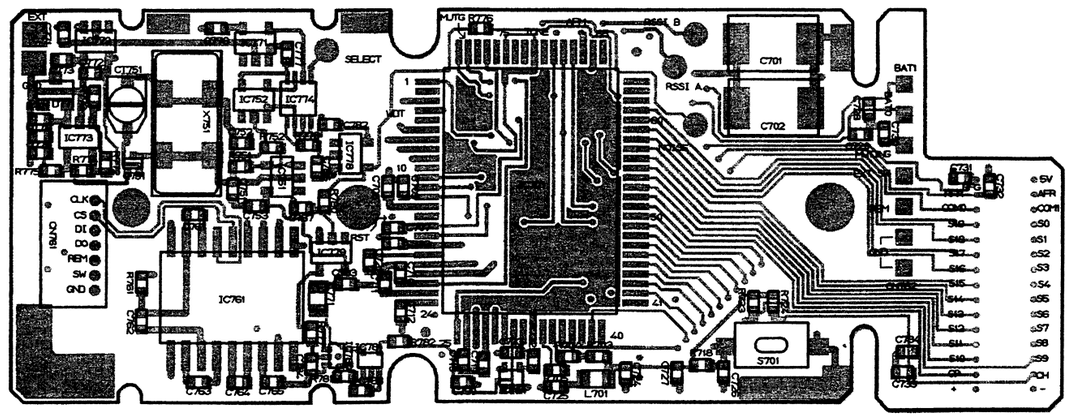
BOARD NO. 1-657-744-11, -12, -13

B-¥WRR85S/A-TUN7-S/M-02

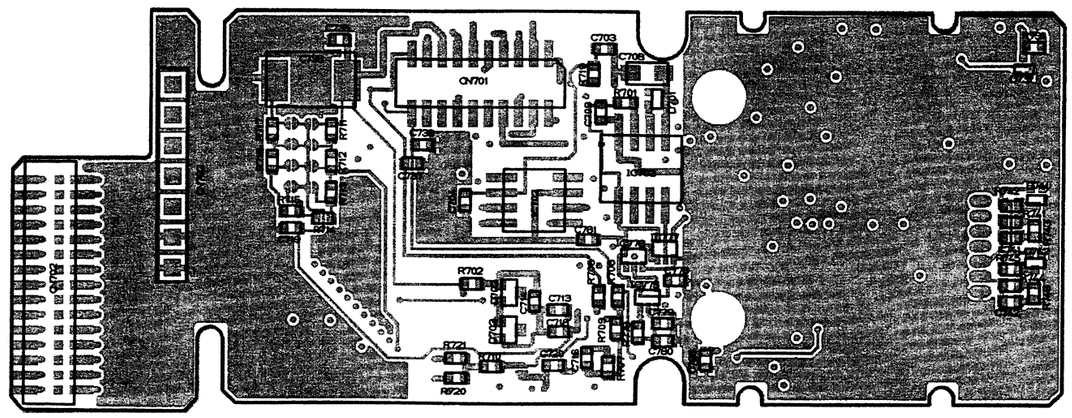
6-4 6-4

A | B | C | D | E | F | G | H

1 2 3 4 5

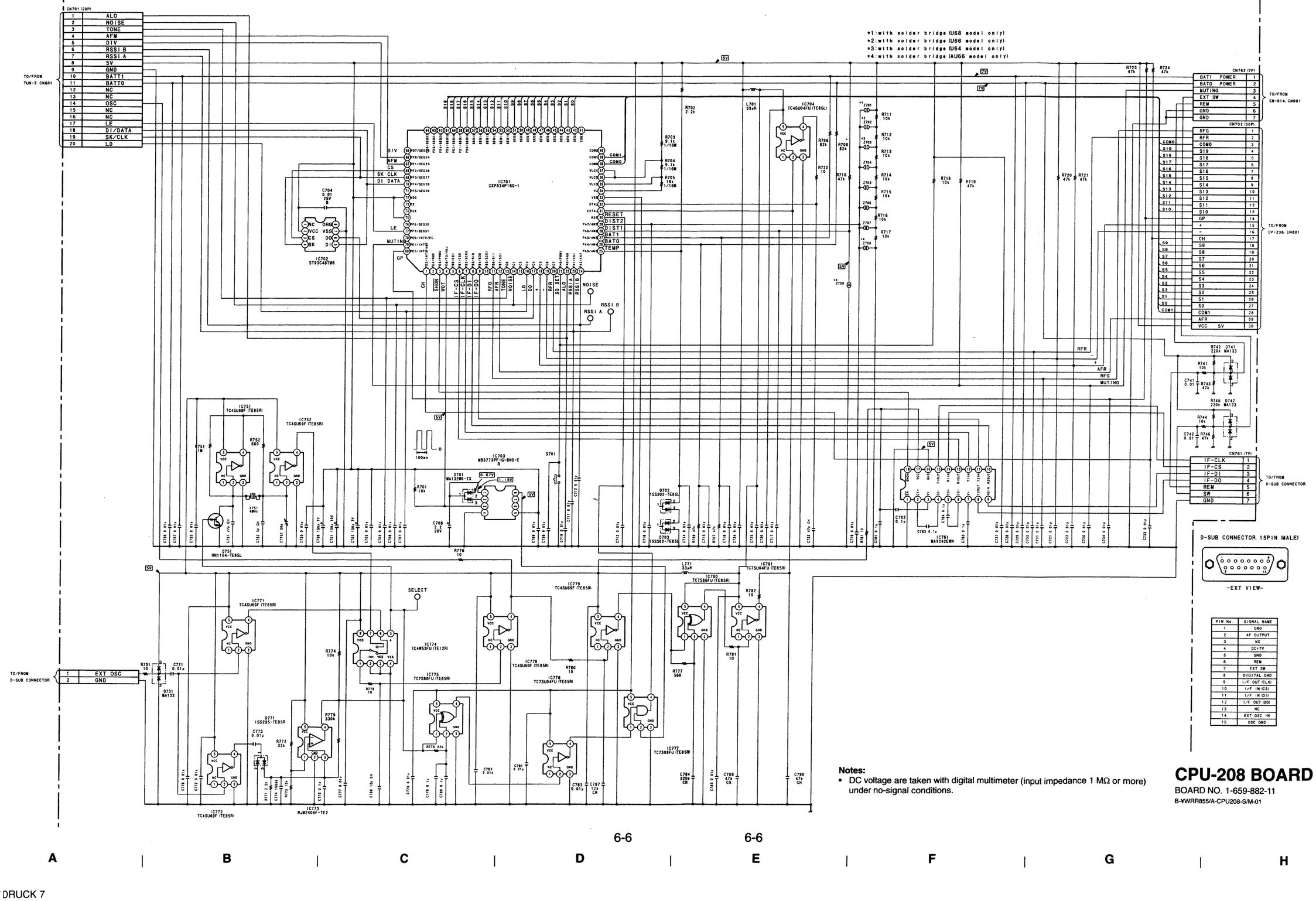


CPU-208 A SIDE
BOARD No. 1-659-882-11



CPU-208 B SIDE
BOARD No. 1-659-882-11

CPU-208



PIN No	SIGNAL NAME
1	GND
2	AF OUTPUT
3	NC
4	DC+7V
5	GND
6	REM
7	EXT SW
8	DIGITAL GND
9	I/F OUT (CLK)
10	I/F IN (CS)
11	I/F IN (DI)
12	I/F OUT (DO)
13	NC
14	EXT OSC IN
15	OSC GND

Notes:
- DC voltage are taken with digital multimeter (input impedance 1 MΩ or more) under no-signal conditions.

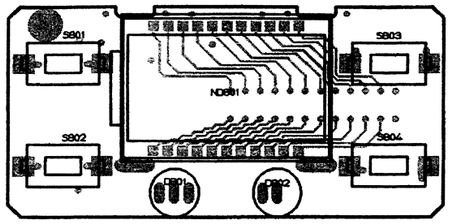
CPU-208 BOARD

BOARD NO. 1-659-882-11

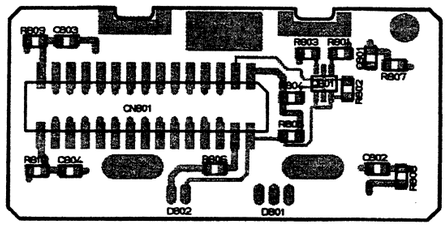
B-WWR855/A-CPU208-S/M-01

6-6 6-6

DP-236

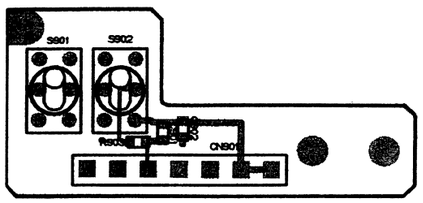


DP-236 A SIDE
BOARD No. 1-659-883-11

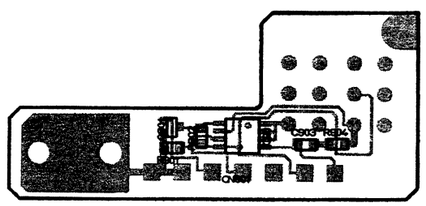


DP-236 B SIDE
BOARD No. 1-659-883-11

SW-814

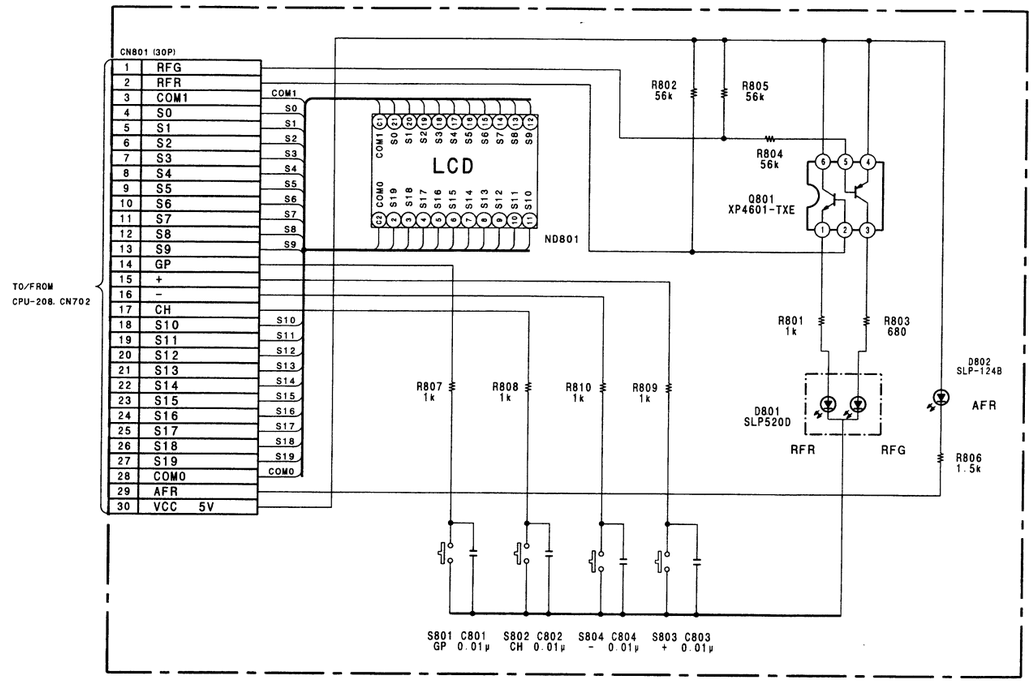


SW-814 A SIDE
BOARD No. 1-659-884-11



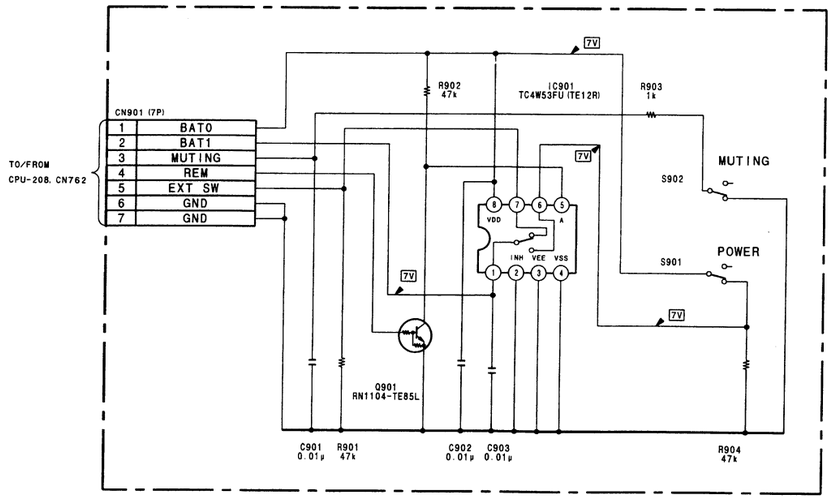
SW-814 B SIDE
BOARD No. 1-659-884-11

DP-236



DP-236 BOARD
BOARD NO. 1-659-883-11
B-¥WRR855/A-DP236-S/M-01

SW-814



Notes:
- DC voltage are taken with digital multimeter (input impedance 1 MΩ or more) under no-signal conditions.

SW-814 BOARD
BOARD NO. 1-659-884-11
B-¥WRR855/A-SW814-S/M-01

Section 7
Spare Parts

7-1. Notes on Repair Parts

1. Safety Related Components Warning

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.
Parts list has the present standardized repair parts.

3. Stock of Parts

Parts marked with "o" at SP(Supply Code) column of the spare parts list may be not stocked. Therefore, the delivery date will be delayed.

4. Units Representation

The following represented units are changed or omitted in writing.

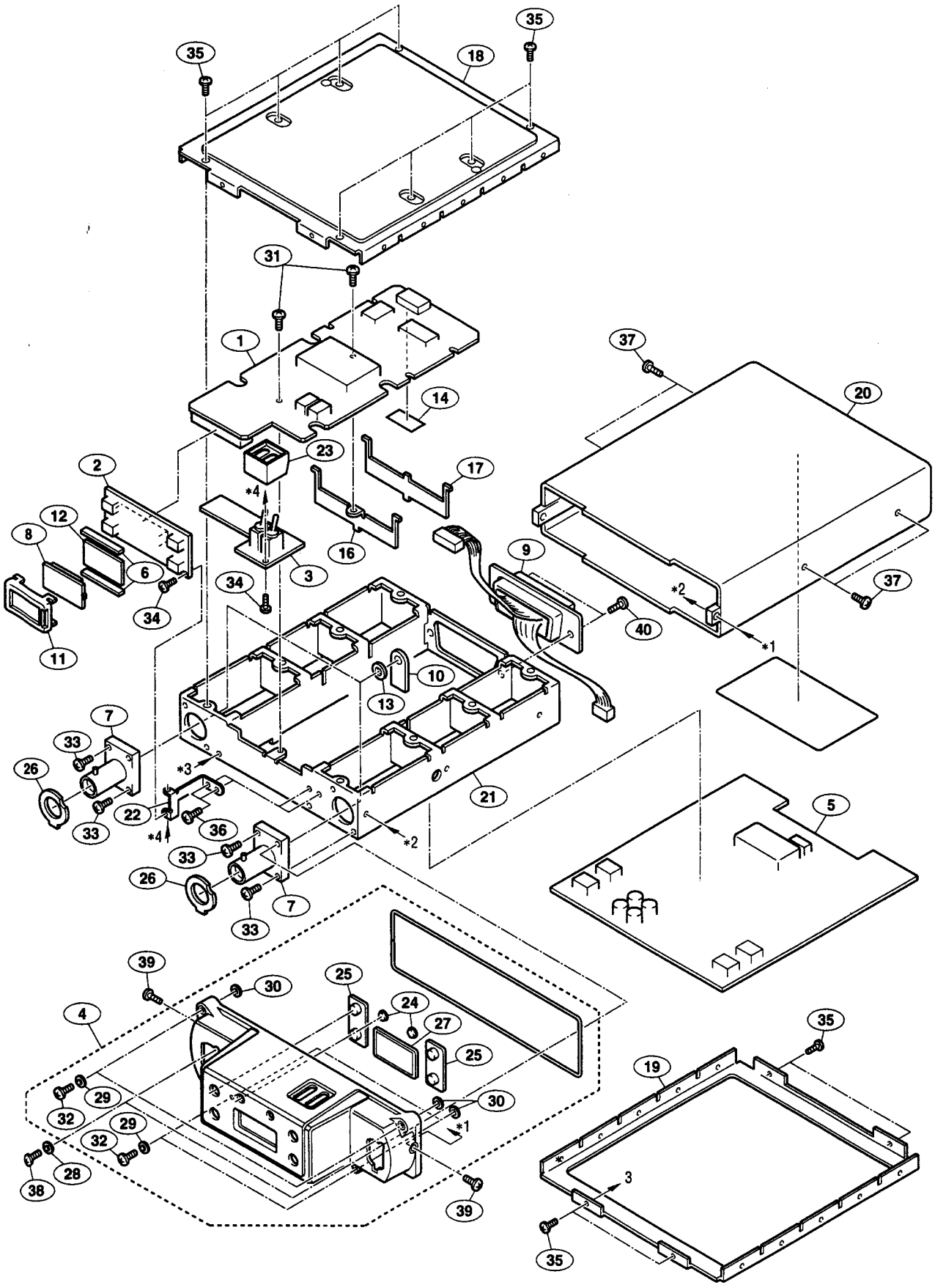
Units		Representation
Capacitance	μF	uF
Inductance	μH	uH
Resistance	Ω	Abbreviation
Temperature	°C	XXX-DEG-C

5. Destination Representation

The part indicated "For U/AU" in the spare parts list is used in the unit written below.
For U : The part is used in a unit for U.S.A.
For AU: The part is used in a unit for Australia.

7-2. Exploded View and Parts List

No.	Part No.	SP	Description
1	A-8272-760-A	o	MOUNTED CIRCUIT BOARD, CPU-208
2	A-8272-761-A	o	MOUNTED CIRCUIT BOARD, DP-236
3	A-8272-762-A	o	MOUNTED CIRCUIT BOARD, SW-814
4	A-8272-763-A	o	PANEL ASSY, FRONT
5	A-8272-766-A	o	MOUNTED CIRCUIT BOARD, TUN-7 (For U68 model, AU66 model)
	A-8322-279-A	o	MOUNTED CIRCUIT BOARD, TUN-7 (For U66 model)
	A-8322-280-A	o	MOUNTED CIRCUIT BOARD, TUN-7 (For U64 model)
6	1-537-824-11	s	CONDUCTIVE BOARD, CONNECTION
7	1-750-659-11	s	CONNECTOR, COAXIAL (BNC TYPE)
8	1-810-716-11	s	LCD
9	1-955-597-11	o	HARNESS, SUB (I/F CABLE)
10	2-532-913-00	s	PLATE, CONTACT
11	2-544-406-01	o	CASE, LCD
12	2-544-412-01	o	SPACER, LCD
13	3-555-872-01	s	SPACER
14	3-561-902-01	o	CLOTH, RETAINING, CASSETTE
16	3-689-828-01	o	PLATE(A), SHIELD
17	3-689-829-01	o	PLATE(B), SHIELD
18	3-689-830-01	o	LID(A), T-CASE
19	3-689-831-01	o	LID(B), T-CASE
20	3-695-860-01	o	CASE
21	3-695-862-01	o	TUNER CASE
22	3-695-864-02	o	BRACKET, PCB
23	3-695-865-01	o	PACKING, SWITCH
24	3-695-866-01	o	SPACER, LED
25	3-695-867-02	o	SPACER, SWITCH
26	3-695-868-01	o	PACKING, BNC
27	3-695-869-01	o	PLATE, DISPLAY
29	3-701-438-11	s	WASHER, 2.5 ϕ
30	3-742-004-01	s	RING, NYLON
31	7-621-255-25	s	SCREW +P 2X4
32	7-621-284-40	s	SCREW +P 2.6X10
33	7-627-452-27	s	SCREW +K 2X4
34	7-627-552-07	s	SCREW,PRECISION +P 1.7X2.5
35	7-627-552-27	s	SCREW,PRECISION +P 1.7X2
36	7-627-553-37	s	SCREW,PRECISION +P 2X3
37	7-627-553-38	s	SCREW,PRECISION +P 2X3
38	7-627-553-58	s	SCREW,PRECISION +P 2X4.5
39	7-627-553-88	s	SCREW,PRECISION +P 2X7
40	7-627-556-37	s	SCREW,PRECISION +P 2.6X4 TYPE 1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7-3. Electrical Parts List

CPU-208 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8272-760-A	o	MOUNTED CIRCUIT BOARD, CPU-208
(This assembly includes the following parts.)			
C701	1-110-528-91	s	TANTALUM, CHIP 150uF 10% 6.3V
C702	1-110-528-91	s	TANTALUM, CHIP 150uF 10% 6.3V
C703	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C704	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C705	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C706	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C707	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C708	1-104-915-11	s	TANTALUM, CHIP 2.2uF 20% 20V
C709	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C710	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C711	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C712	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C713	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C714	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C715	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C716	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C717	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C718	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C719	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C720	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C721	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C722	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C723	1-162-923-11	s	CERAMIC, CHIP 47PF 5% 50V
C724	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C725	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C726	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C727	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C728	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C729	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C730	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C731	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C732	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C733	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C734	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C735	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C736	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C737	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C738	1-110-528-91	s	TANTALUM, CHIP 150uF 10% 6.3V
C741	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C742	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C751	1-162-920-11	s	CERAMIC, CHIP 27PF 5% 50V
C752	1-162-910-11	s	CERAMIC, CHIP 5PF 50V
C753	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C761	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C762	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C763	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C764	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C765	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C771	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C772	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C773	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C774	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C775	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C776	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C777	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C778	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V

(CPU-208 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C779	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C780	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C781	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C782	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C783	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C784	1-162-957-11	s	CERAMIC, CHIP 220PF 5% 50V
C785	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C786	1-162-916-11	s	CERAMIC, CHIP 12PF 5% 50V
C787	1-162-916-11	s	CERAMIC, CHIP 12PF 5% 50V
C788	1-162-923-11	s	CERAMIC, CHIP 47PF 5% 50V
C790	1-162-923-11	s	CERAMIC, CHIP 47PF 5% 50V
C791	1-104-752-11	s	TANTALUM, CHIP 33uF 20% 6.3V
CN701	1-774-178-11	o	CONNECTOR, BOARD TO BOARD 20P, MALE
CN702	1-691-943-21	o	CONNECTOR, BOARD TO BOARD 30P, FEMALE
CN761	1-565-154-11	o	CONNECTOR, ANGLE TYPE 7P, MALE
CN762	1-774-796-11	o	CONNECTOR SIL 7P (PC BOARD)
CT751	1-141-322-11	s	TRIMMER, CHIP
D701	8-719-421-67	s	DIODE MA132WK
D702	8-719-820-41	s	DIODE 1SS302
D703	8-719-820-41	s	DIODE 1SS302
D731	8-719-421-69	s	DIODE MA133
D741	8-719-421-69	s	DIODE MA133
D742	8-719-421-69	s	DIODE MA133
D771	8-719-044-80	s	DIODE 1SS295(TE85R)
IC701	8-752-874-04	s	IC CXP834P16Q-1-006
IC702	8-759-163-08	s	IC ST93C46TM6
IC703	8-759-988-82	s	IC MB3773PF
IC704	8-759-058-60	s	IC TC7SU04FU(TE85R)
IC751	8-759-209-15	s	IC TC4SU69F
IC752	8-759-209-15	s	IC TC4SU69F
IC761	8-759-163-11	s	IC MAX242EWN*
	8-759-175-11	s	IC MAX242CWN*
	* Choise part		
IC771	8-759-209-15	s	IC TC4SU69F
IC772	8-759-209-15	s	IC TC4SU69F
IC773	8-759-710-82	s	IC NJM2406F
IC774	8-759-082-61	s	IC TC4W53FU
IC775	8-759-195-81	s	IC TC7S86FU
IC776	8-759-058-60	s	IC TC7SU04FU(TE85R)
IC777	8-759-058-62	s	IC TC7S08FU(TE85R)
IC778	8-759-209-15	s	IC TC4SU69F
IC779	8-759-209-15	s	IC TC4SU69F
IC780	8-759-195-81	s	IC TC7S86FU
IC781	8-759-058-60	s	IC TC7SU04FU(TE85R)
L701	1-414-194-11	s	INDUCTOR, CHIP 33uH
L771	1-414-194-11	s	INDUCTOR, CHIP 33uH
Q751	8-729-429-18	s	TRANSISTOR UN9213
R701	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R702	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R703	1-218-870-11	s	METAL, CHIP 9.1K 0.50% 1/16W
R704	1-218-870-11	s	METAL, CHIP 9.1K 0.50% 1/16W
R705	1-216-836-11	s	METAL, CHIP 18K 5% 1/16W
R706	1-216-844-11	s	METAL, CHIP 82K 5% 1/16W
R707	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R708	1-216-844-11	s	METAL, CHIP 82K 5% 1/16W
R709	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R710	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W

(CPU-208 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R711	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R712	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R713	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R714	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R715	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R716	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R717	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R718	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R719	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R720	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R721	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R722	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R723	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R724	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R731	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R741	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R742	1-216-849-11	s	METAL, CHIP 220K 5% 1/16W
R743	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R744	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R745	1-216-849-11	s	METAL, CHIP 220K 5% 1/16W
R746	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R751	1-216-857-11	s	METAL, CHIP 1M 5% 1/16W
R752	1-216-819-11	s	METAL, CHIP 680 5% 1/16W
R761	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R771	1-216-827-11	s	METAL, CHIP 3.3K 5% 1/16W
R772	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R773	1-216-835-11	s	METAL, CHIP 15K 5% 1/16W
R774	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R775	1-216-851-11	s	METAL, CHIP 330K 5% 1/16W
R776	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R777	1-216-818-11	s	METAL, CHIP 560 5% 1/16W
R778	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R779	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R780	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R781	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R782	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
S701	1-572-473-11	s	SWITCH, TACTIL
X751	1-760-514-11	s	CRYSTAL 4.000MHz

DP-236 BOARD.

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8272-761-A	o	MOUNTED CIRCUIT BOARD, DP-236
(This assembly includes the following parts.)			
C801	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C802	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C803	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C804	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
CN801	1-691-942-11	s	CONNECTOR, BOARD TO BOARD 30P, MALE
D801	8-719-905-20	s	LED SLP520D, RED/GRN
D802	8-719-900-24	s	LED SLP-124B, RED
Q801	8-729-427-74	s	TRANSISTOR XP4601
R801	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R802	1-216-842-11	s	METAL, CHIP 56K 5% 1/16W
R803	1-216-819-11	s	METAL, CHIP 680 5% 1/16W
R804	1-216-842-11	s	METAL, CHIP 56K 5% 1/16W
R805	1-216-842-11	s	METAL, CHIP 56K 5% 1/16W
R806	1-216-823-11	s	METAL, CHIP 1.5K 5% 1/16W
R807	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R808	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R809	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R810	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
S801	1-692-459-11	s	SWITCH, TACTIL
S802	1-692-459-11	s	SWITCH, TACTIL
S803	1-692-459-11	s	SWITCH, TACTIL
S804	1-692-459-11	s	SWITCH, TACTIL

SW-814 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8272-762-A	o	MOUNTED CIRCUIT BOARD, SW-814
(This assembly includes the following parts.)			
C901	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C902	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C903	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
IC901	8-759-082-61	s	IC TC4W53FU
Q901	8-729-429-18	s	TRANSISTOR UN9213
R901	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R902	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R903	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R904	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
S901	1-570-608-11	s	SWITCH, TOGGLE
S902	1-570-608-11	s	SWITCH, TOGGLE

TUN-7 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8272-766-A	o	MOUNTED CIRCUIT BOARD, TUN-7 (For U68 model, AU66 model)
	A-8322-279-A	o	MOUNTED CIRCUIT BOARD, TUN-7 (For U66 model)
	A-8322-280-A	o	MOUNTED CIRCUIT BOARD, TUN-7 (For U64 model)

(These assemblies include the following parts.)

C101	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C102	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C103	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C104	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C105	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C106	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C107	1-162-910-11	s	CERAMIC, CHIP 5PF 50V
C108	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C109	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C110	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C111	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C112	1-162-926-11	s	CERAMIC, CHIP 82PF 5% 50V
C113	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C114	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C115	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C116	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C117	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C118	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C119	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C120	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C121	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C122	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C123	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C124	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C125	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C126	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C127	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C128	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C129	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C130	1-162-920-11	s	CERAMIC, CHIP 27PF 5% 50V
C131	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C132	1-104-851-11	s	TANTALUM, CHIP 10uF 20% 10V
C133	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C134	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C135	1-104-851-11	s	TANTALUM, CHIP 10uF 20% 10V
C144	1-104-851-11	s	TANTALUM, CHIP 10uF 20% 10V
C145	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C146	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C147	1-104-851-11	s	TANTALUM, CHIP 10uF 20% 10V
C148	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C149	1-101-005-00	s	CERAMIC 0.022uF 50V
C201	1-104-851-11	s	TANTALUM, CHIP 10uF 20% 10V
C202	1-135-201-11	s	TANTALUM, CHIP 10uF 20% 6.3V
C203	1-162-916-11	s	CERAMIC, CHIP 12PF 5% 50V
C204	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C205	1-104-851-11	s	TANTALUM, CHIP 10uF 20% 10V
C206	1-104-851-11	s	TANTALUM, CHIP 10uF 20% 10V
C207	1-135-201-11	s	TANTALUM, CHIP 10uF 20% 6.3V
C208	1-162-916-11	s	CERAMIC, CHIP 12PF 5% 50V
C209	1-104-851-11	s	TANTALUM, CHIP 10uF 20% 10V
C212	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C213	1-135-201-11	s	TANTALUM, CHIP 10uF 20% 6.3V
C214	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V

Ref. No. or Q'ty	Part No.	SP	Description
C215	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C216	1-104-851-11	s	TANTALUM, CHIP 10uF 20% 10V
C217	1-135-201-11	s	TANTALUM, CHIP 10uF 20% 6.3V
C218	1-104-553-11	s	FILM, CHIP 0.015uF 5% 16V
C219	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C220	1-104-539-11	s	FILM, CHIP 0.001uF 5% 50V
C221	1-104-544-11	s	FILM, CHIP 0.0027uF 5% 50V
C222	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C224	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C225	1-104-559-11	s	FILM, CHIP 0.047uF 5% 16V
C226	1-135-201-11	s	TANTALUM, CHIP 10uF 20% 6.3V
C228	1-135-076-21	s	TANTALUM, CHIP 1uF 10% 35V
C229	1-135-076-21	s	TANTALUM, CHIP 1uF 10% 35V
C230	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C231	1-126-412-11	s	ELECT, CHIP 220uF 20% 4V
C234	1-104-559-11	s	FILM, CHIP 0.047uF 5% 16V
C235	1-135-201-11	s	TANTALUM, CHIP 10uF 20% 6.3V
C236	1-162-919-11	s	CERAMIC, CHIP 22PF 5% 50V
C237	1-104-851-11	s	TANTALUM, CHIP 10uF 20% 10V
C239	1-162-919-11	s	CERAMIC, CHIP 22PF 5% 50V
C240	1-135-201-11	s	TANTALUM, CHIP 10uF 20% 6.3V
C241	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C242	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C243	1-135-177-21	s	TANTALUM, CHIP 1uF 10% 25V
C244	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C245	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C246	1-163-275-11	s	CERAMIC, CHIP 0.001uF 5% 50V
C247	1-163-275-11	s	CERAMIC, CHIP 0.001uF 5% 50V
C248	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C249	1-135-177-21	s	TANTALUM, CHIP 1uF 10% 25V
C250	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C251	1-135-201-11	s	TANTALUM, CHIP 10uF 20% 6.3V
C252	1-162-928-11	s	CERAMIC, CHIP 120PF 5% 50V
C253	1-135-211-11	s	TANTALUM, CHIP 6.8uF 20% 6.3V
C254	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C255	1-135-201-11	s	TANTALUM, CHIP 10uF 20% 6.3V
C256	1-162-915-11	s	CERAMIC, CHIP 10PF 5% 50V
C257	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C258	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C259	1-135-177-21	s	TANTALUM, CHIP 1uF 10% 25V
C260	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C261	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C262	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C263	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C264	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C265	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C266	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C267	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C268	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C269	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C270	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C301	1-162-916-11	s	CERAMIC, CHIP 12PF 5% 50V
C302	1-135-161-21	s	TANTALUM, CHIP 22uF 10% 10V
C303	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C304	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C305	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C306	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C307	1-135-211-11	s	TANTALUM, CHIP 6.8uF 20% 6.3V
C308	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C309	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C310	1-135-166-21	s	TANTALUM, CHIP 47uF 10% 10V
C311	1-135-166-21	s	TANTALUM, CHIP 47uF 10% 10V

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Ref. No. or Q'ty	Part No.	SP	Description
C312	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C313	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C314	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C315	1-162-905-11	s	CERAMIC, CHIP 1PF 50V
C316	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C317	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C318	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C319	1-162-905-11	s	CERAMIC, CHIP 1PF 50V
C320	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C321	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C322	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C323	1-162-908-11	s	CERAMIC, CHIP 3PF 50V
C324	1-162-908-11	s	CERAMIC, CHIP 3PF 50V
C325	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C326	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C327	1-162-916-11	s	CERAMIC, CHIP 12PF 5% 50V
C328	1-162-916-11	s	CERAMIC, CHIP 12PF 5% 50V
C329	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C330	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C331	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C401	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C402	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C403	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C404	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C405	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C406	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C407	1-162-910-11	s	CERAMIC, CHIP 5PF 50V
C408	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C409	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C410	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C411	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C412	1-162-926-11	s	CERAMIC, CHIP 82PF 5% 50V
C413	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C414	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C415	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C416	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C417	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C418	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C419	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C420	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C421	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C422	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C423	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C424	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C425	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C426	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C427	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C428	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C429	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C430	1-162-920-11	s	CERAMIC, CHIP 27PF 5% 50V
C431	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C432	1-104-851-11	s	TANTALUM, CHIP 10uF 20% 10V
C433	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C434	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C435	1-104-851-11	s	TANTALUM, CHIP 10uF 20% 10V
C444	1-104-851-11	s	TANTALUM, CHIP 10uF 20% 10V
C445	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C446	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C447	1-104-851-11	s	TANTALUM, CHIP 10uF 20% 10V

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Ref. No. or Q'ty	Part No.	SP	Description
C448	1-162-964-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C449	1-101-005-00	s	CERAMIC 0.022uF 50V
C651	1-110-398-11	s	TANTALUM, CHIP 15uF 20% 35V
C652	1-127-561-11	s	ELECT 33uF 20% 10V
C653	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C654	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C655	1-127-561-11	s	ELECT 33uF 20% 10V
C656	1-164-227-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C657	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C658	1-107-826-11	s	CERAMIC 0.1uF 10% 16V
C659	1-128-393-11	s	ELECT 100uF 20% 10V
C660	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C661	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C662	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C663	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
CF101	1-760-027-11	s	FILTER, CERAMIC
CF102	1-760-027-11	s	FILTER, CERAMIC
CF103	1-760-027-11	s	FILTER, CERAMIC
CF104	1-760-027-11	s	FILTER, CERAMIC
CF401	1-760-027-11	s	FILTER, CERAMIC
CF402	1-760-027-11	s	FILTER, CERAMIC
CF403	1-760-027-11	s	FILTER, CERAMIC
CF404	1-760-027-11	s	FILTER, CERAMIC
CN102	1-750-932-11	o	CONNECTOR, BNC, FEMALE
CN402	1-750-932-11	o	CONNECTOR, BNC, FEMALE
CN601	1-568-359-11	s	CONNECTOR, BOARD TO BOARD 20P
CN602	1-565-137-11	o	CONNECTOR, STRAIGHT TYPE 4P, MALE
CP301	1-760-816-21	s	VCO 938MHz (For U68 model, AU66 model)
	1-760-962-21	s	VCO 920MHz (For U64 model, U66 model)
CP302	1-760-815-11	s	CRYSTAL 140.05MHz
CT101	1-141-325-11	s	TRIMMER, CHIP
CT102	1-141-325-11	s	TRIMMER, CHIP
CT103	1-141-325-11	s	TRIMMER, CHIP
CT104	1-141-325-11	s	TRIMMER, CHIP
CT105	1-141-327-11	s	TRIMMER, CHIP
CT106	1-141-327-11	s	TRIMMER, CHIP
CT302	1-141-435-21	s	TRIMMER, CHIP
CT303	1-141-435-21	s	TRIMMER, CHIP
CT401	1-141-325-11	s	TRIMMER, CHIP
CT402	1-141-325-11	s	TRIMMER, CHIP
CT403	1-141-325-11	s	TRIMMER, CHIP
CT404	1-141-325-11	s	TRIMMER, CHIP
CT405	1-141-327-11	s	TRIMMER, CHIP
CT406	1-141-327-11	s	TRIMMER, CHIP
D201	8-719-421-67	s	DIODE MA132WK
D202	8-719-421-67	s	DIODE MA132WK
D203	8-719-421-67	s	DIODE MA132WK
D204	8-719-421-67	s	DIODE MA132WK
FL101	1-233-387-11	S	FILTER, BANDPASS 776 MHz (For U64 model)
	1-233-388-11	S	FILTER, BANDPASS 788 MHz (For U66 model)
	1-239-934-11	S	FILTER, BANDPASS 798 MHz (For U68 model, AU66 model)
FL102	1-233-387-11	S	FILTER, BANDPASS 776 MHz (For U64 model)
	1-233-388-11	S	FILTER, BANDPASS 788 MHz (For U66 model)
	1-239-934-11	S	FILTER, BANDPASS 798 MHz (For U68 model, AU66 model)

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Ref. No. or Q'ty	Part No.	SP	Description
FL401	1-233-387-11	S	FILTER, BANDPASS 776 MHz (For U64 model)
	1-233-388-11	S	FILTER, BANDPASS 788 MHz (For U66 model)
	1-239-934-11	S	FILTER, BANDPASS 798 MHz (For U68 model, AU66 model)
FL402	1-233-387-11	S	FILTER, BANDPASS 776 MHz (For U64 model)
	1-233-388-11	S	FILTER, BANDPASS 788 MHz (For U66 model)
	1-239-934-11	S	FILTER, BANDPASS 798 MHz (For U68 model, AU66 model)
IC101	8-759-355-20	s	IC TA31161FN(EL)
IC102	8-759-230-39	s	IC TA8122AF
IC201	8-759-198-34	s	IC TA75S558F
IC202	8-759-198-34	s	IC TA75S558F
IC203	8-759-523-02	s	IC TC74HC4053AFT
IC204	8-759-198-34	s	IC TA75S558F
IC205	8-759-198-34	s	IC TA75S558F
IC206	8-759-539-60	s	IC SA575DK-T
IC207	8-759-198-34	s	IC TA75S558F
IC208	8-759-198-34	s	IC TA75S558F
IC209	8-759-330-32	s	IC TC75S51F-TE85L
IC210	8-759-075-66	s	IC TA75S01F
IC211	8-759-198-34	s	IC TA75S558F
IC212	8-759-075-66	s	IC TA75S01F
IC213	8-759-075-66	s	IC TA75S01F
IC214	8-759-330-32	s	IC TC75S51F-TE85L
IC215	8-759-075-66	s	IC TA75S01F
IC301	8-759-512-18	s	IC MB1512PFV-G-BND
IC302	8-759-075-70	s	IC TA75S393F
IC401	8-759-355-20	s	IC TA31161FN(EL)
IC402	8-759-230-39	s	IC TA8122AF
IC651	8-759-095-59	s	IC M5237ML-TP1
IC652	8-759-512-51	s	IC RH5RE50AA
L101	1-414-239-21	s	INDUCTOR, CHIP 6.8nH
L102	1-414-239-21	s	INDUCTOR, CHIP 6.8nH
L103	1-414-239-21	s	INDUCTOR, CHIP 6.8nH
L104	1-414-238-21	s	INDUCTOR, CHIP 4.7nH
L105	1-410-733-11	s	INDUCTOR, CHIP 0.22uH
L106	1-410-735-21	s	INDUCTOR, CHIP 0.33uH
L107	1-410-733-11	s	INDUCTOR, CHIP 0.22uH
L108	1-410-381-11	s	INDUCTOR, CHIP 10uH
L109	1-410-381-11	s	INDUCTOR, CHIP 10uH
L110	1-410-381-11	s	INDUCTOR, CHIP 10uH
L302	1-414-287-11	s	INDUCTOR, CHIP 6.8nH
L303	1-414-238-21	s	INDUCTOR, CHIP 4.7nH
L304	1-414-238-21	s	INDUCTOR, CHIP 4.7nH
L305	1-410-733-11	s	INDUCTOR, CHIP 0.22uH
L306	1-410-731-31	s	INDUCTOR, CHIP 0.15uH
L307	1-410-731-31	s	INDUCTOR, CHIP 0.15uH
L308	1-410-730-11	s	INDUCTOR, CHIP 0.12uH
L309	1-410-730-11	s	INDUCTOR, CHIP 0.12uH
L401	1-414-239-21	s	INDUCTOR, CHIP 6.8nH
L402	1-414-239-21	s	INDUCTOR, CHIP 6.8nH
L403	1-414-239-21	s	INDUCTOR, CHIP 6.8nH
L404	1-414-238-21	s	INDUCTOR, CHIP 4.7nH
L405	1-410-733-11	s	INDUCTOR, CHIP 0.22uH
L406	1-410-735-21	s	INDUCTOR, CHIP 0.33uH
L407	1-410-733-11	s	INDUCTOR, CHIP 0.22uH

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Ref. No. or Q'ty	Part No.	SP	Description
L408	1-410-381-11	s	INDUCTOR, CHIP 10uH
L409	1-410-381-11	s	INDUCTOR, CHIP 10uH
L410	1-410-381-11	s	INDUCTOR, CHIP 10uH
L651	1-424-274-21	s	COIL, CHOKE 50uH
Q101	8-729-143-32	s	TRANSISTOR 3SK177-U72
Q102	8-729-020-57	s	TRANSISTOR 3SK245-U55
Q103	8-729-020-57	s	TRANSISTOR 3SK245-U55
Q104	8-729-020-57	s	TRANSISTOR 3SK245-U55
Q105	8-729-020-57	s	TRANSISTOR 3SK245-U55
Q106	8-729-402-19	s	TRANSISTOR XN6501
Q107	8-729-402-19	s	TRANSISTOR XN6501
Q301	8-729-230-81	s	TRANSISTOR 2SC3606
Q302	8-729-230-81	s	TRANSISTOR 2SC3606
Q303	8-729-425-64	s	TRANSISTOR 2SD2216-Q
Q304	8-729-101-11	s	TRANSISTOR 2SC2351-R2
Q305	8-729-101-11	s	TRANSISTOR 2SC2351-R2
Q401	8-729-143-32	s	TRANSISTOR 3SK177-U72
Q402	8-729-020-57	s	TRANSISTOR 3SK245-U55
Q403	8-729-020-57	s	TRANSISTOR 3SK245-U55
Q404	8-729-020-57	s	TRANSISTOR 3SK245-U55
Q405	8-729-020-57	s	TRANSISTOR 3SK245-U55
Q406	8-729-402-19	s	TRANSISTOR XN6501
Q407	8-729-402-19	s	TRANSISTOR XN6501
Q651	8-729-120-53	s	TRANSISTOR 2SJ132-Z
Q652	8-729-425-64	s	TRANSISTOR 2SD2216-Q
Q653	8-729-820-86	s	TRANSISTOR 2SB1121-ST
R101	1-216-843-11	s	METAL, CHIP 68K 5% 1/16W
R102	1-216-835-11	s	METAL, CHIP 15K 5% 1/16W
R103	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R104	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R105	1-216-812-11	s	METAL, CHIP 180 5% 1/16W
R106	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R107	1-216-844-11	s	METAL, CHIP 82K 5% 1/16W
R108	1-216-834-11	s	METAL, CHIP 12K 5% 1/16W
R109	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R110	1-216-844-11	s	METAL, CHIP 82K 5% 1/16W
R111	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R112	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R113	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R114	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R115	1-216-844-11	s	METAL, CHIP 82K 5% 1/16W
R116	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R117	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R118	1-216-844-11	s	METAL, CHIP 82K 5% 1/16W
R119	1-216-828-11	s	METAL, CHIP 3.9K 5% 1/16W
R120	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R121	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R122	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R123	1-216-836-11	s	METAL, CHIP 18K 5% 1/16W
R124	1-216-831-11	s	METAL, CHIP 6.8K 5% 1/16W
R125	1-216-822-11	s	METAL, CHIP 1.2K 5% 1/16W
R126	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R127	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R128	1-216-814-11	s	METAL, CHIP 270 5% 1/16W
R129	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R130	1-216-836-11	s	METAL, CHIP 18K 5% 1/16W
R131	1-216-831-11	s	METAL, CHIP 6.8K 5% 1/16W
R132	1-216-822-11	s	METAL, CHIP 1.2K 5% 1/16W

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Ref. No. or Q'ty	Part No.	SP	Description
R133	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R134	1-216-798-11	s	METAL, CHIP 12 5% 1/16W
R135	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R136	1-216-814-11	s	METAL, CHIP 270 5% 1/16W
R140	1-216-834-11	s	METAL, CHIP 12K 5% 1/16W
R201	1-216-842-11	s	METAL, CHIP 56K 5% 1/16W
R202	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R203	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R204	1-216-826-11	s	METAL, CHIP 2.7K 5% 1/16W
R205	1-216-832-11	s	METAL, CHIP 8.2K 5% 1/16W
R206	1-218-692-11	s	METAL, CHIP 1K 0.50% 1/16W
R207	1-216-842-11	s	METAL, CHIP 56K 5% 1/16W
R208	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R209	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R210	1-216-826-11	s	METAL, CHIP 2.7K 5% 1/16W
R211	1-216-832-11	s	METAL, CHIP 8.2K 5% 1/16W
R212	1-218-692-11	s	METAL, CHIP 1K 0.50% 1/16W
R213	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R214	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R215	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R216	1-216-842-11	s	METAL, CHIP 56K 5% 1/16W
R217	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R218	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R219	1-216-823-11	s	METAL, CHIP 1.5K 5% 1/16W
R220	1-216-835-11	s	METAL, CHIP 15K 5% 1/16W
R221	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R222	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R223	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R224	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R225	1-218-702-11	s	METAL, CHIP 2.7K 0.50% 1/16W
R226	1-216-842-11	s	METAL, CHIP 56K 5% 1/16W
R227	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R228	1-218-704-11	s	METAL, CHIP 3.3K 0.50% 1/16W
R229	1-218-708-11	s	METAL, CHIP 4.7K 0.50% 1/16W
R230	1-218-708-11	s	METAL, CHIP 4.7K 0.50% 1/16W
R231	1-218-694-11	s	METAL, CHIP 1.2K 0.50% 1/16W
R232	1-218-710-11	s	METAL, CHIP 5.6K 0.50% 1/16W
R233	1-216-831-11	s	METAL, CHIP 6.8K 5% 1/16W
R234	1-218-710-11	s	METAL, CHIP 5.6K 0.50% 1/16W
R235	1-218-694-11	s	METAL, CHIP 1.2K 0.50% 1/16W
R236	1-216-834-11	s	METAL, CHIP 12K 5% 1/16
R237	1-216-835-11	s	METAL, CHIP 15K 5% 1/16W
R247	1-216-842-11	s	METAL, CHIP 56K 5% 1/16W
R248	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R249	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R250	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R251	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R252	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R253	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R254	1-216-854-11	s	METAL, CHIP 560K 5% 1/16W
R255	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R256	1-216-843-11	s	METAL, CHIP 68K 5% 1/16W
R257	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R258	1-216-854-11	s	METAL, CHIP 560K 5% 1/16W
R259	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R260	1-218-704-11	s	METAL, CHIP 3.3K 0.50% 1/16W
R261	1-218-708-11	s	METAL, CHIP 4.7K 0.50% 1/16W
R262	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R263	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R264	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W

(TUN-7 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R265	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R266	1-216-854-11	s	METAL, CHIP 560K 5% 1/16W
R267	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R268	1-216-842-11	s	METAL, CHIP 56K 5% 1/16W
R269	1-216-854-11	s	METAL, CHIP 560K 5% 1/16W
R270	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R271	1-216-823-11	s	METAL, CHIP 1.5K 5% 1/16W
R272	1-216-844-11	s	METAL, CHIP 82K 5% 1/16W
R273	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R274	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R275	1-216-854-11	s	METAL, CHIP 560K 5% 1/16W
R276	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R277	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R278	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R279	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R280	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R281	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R282	1-216-854-11	s	METAL, CHIP 560K 5% 1/16W
R283	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R284	1-216-843-11	s	METAL, CHIP 68K 5% 1/16W
R285	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R286	1-216-854-11	s	METAL, CHIP 560K 5% 1/16W
R287	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R302	1-216-809-11	s	METAL, CHIP 100 5% 1/16W
R303	1-216-805-11	s	METAL, CHIP 47 5% 1/16W
R304	1-216-842-11	s	METAL, CHIP 56K 5% 1/16W
R305	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R306	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R307	1-216-851-11	s	METAL, CHIP 330K 5% 1/16W
R308	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R309	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R310	1-216-832-11	s	METAL, CHIP 8.2K 5% 1/16W
R311	1-216-819-11	s	METAL, CHIP 680 5% 1/16W
R312	1-216-809-11	s	METAL, CHIP 100 5% 1/16W
R313	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R314	1-216-831-11	s	METAL, CHIP 6.8K 5% 1/16W
R315	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R316	1-216-815-11	s	METAL, CHIP 330 5% 1/16W
R317	1-216-831-11	s	METAL, CHIP 6.8K 5% 1/16W
R318	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R319	1-216-815-11	s	METAL, CHIP 330 5% 1/16W
R320	1-216-807-11	s	METAL, CHIP 68 5% 1/16W
R321	1-216-807-11	s	METAL, CHIP 68 5% 1/16W
R322	1-216-809-11	s	METAL, CHIP 100 5% 1/16W
R323	1-216-817-11	s	METAL, CHIP 470 5% 1/16W
R324	1-216-817-11	s	METAL, CHIP 470 5% 1/16W
R325	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R326	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R327	1-216-815-11	s	METAL, CHIP 330 5% 1/16W
R328	1-216-815-11	s	METAL, CHIP 330 5% 1/16W
R329	1-216-815-11	s	METAL, CHIP 330 5% 1/16W
R401	1-216-843-11	s	METAL, CHIP 68K 5% 1/16W
R402	1-216-835-11	s	METAL, CHIP 15K 5% 1/16W
R403	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R404	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R405	1-216-812-11	s	METAL, CHIP 180 5% 1/16W
R406	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R407	1-216-844-11	s	METAL, CHIP 82K 5% 1/16W
R408	1-216-834-11	s	METAL, CHIP 12K 5% 1/16W
R409	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W

(TUN-7 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R410	1-216-844-11	s	METAL, CHIP 82K 5% 1/16W
R411	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R412	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R413	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R414	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R415	1-216-844-11	s	METAL, CHIP 82K 5% 1/16W
R416	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R417	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R418	1-216-844-11	s	METAL, CHIP 82K 5% 1/16W
R419	1-216-828-11	s	METAL, CHIP 3.9K 5% 1/16W
R420	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R421	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R422	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R423	1-216-836-11	s	METAL, CHIP 18K 5% 1/16W
R424	1-216-831-11	s	METAL, CHIP 6.8K 5% 1/16W
R425	1-216-822-11	s	METAL, CHIP 1.2K 5% 1/16W
R426	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R427	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R428	1-216-814-11	s	METAL, CHIP 270 5% 1/16W
R429	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R430	1-216-836-11	s	METAL, CHIP 18K 5% 1/16W
R431	1-216-831-11	s	METAL, CHIP 6.8K 5% 1/16W
R432	1-216-822-11	s	METAL, CHIP 1.2K 5% 1/16W
R433	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R434	1-216-798-11	s	METAL, CHIP 12 5% 1/16W
R435	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R436	1-216-814-11	s	METAL, CHIP 270 5% 1/16W
R440	1-216-834-11	s	METAL, CHIP 12K 5% 1/16W
R651	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R652	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R653	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R654	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R655	1-216-813-11	s	METAL, CHIP 220 5% 1/16W
R656	1-216-817-11	s	METAL, CHIP 470 5% 1/16W
R657	1-218-722-11	s	METAL, CHIP 18K 0.50% 1/16W
R658	1-218-708-11	s	METAL, CHIP 4.7K 0.50% 1/16W
RV201	1-241-832-21	s	RES, ADJ CERMET 5K
RV202	1-241-832-21	s	RES, ADJ CERMET 5K
RV205	1-241-834-21	s	RES, ADJ CERMET 20K
SWF101	1-760-028-11	s	FILTER, SAW
SWF401	1-760-028-11	s	FILTER, SAW
T101	1-406-784-21	s	TRANSFORMER, IF
T102	1-406-782-21	s	TRANSFORMER, IF
T103	1-411-494-11	s	COIL, DEMODULATOR
T301	1-406-785-21	s	COIL, BALANCE
T401	1-406-784-21	s	TRANSFORMER, IF
T402	1-406-782-21	s	TRANSFORMER, IF
T403	1-411-494-11	s	COIL, DEMODULATOR
X201	1-567-098-41	s	CRYSTAL 32.768KHz
X203	1-760-252-12	s	CRYSTAL 32.768KHz

FRAME

Ref. No. or Q'ty	Part No.	SP	Description
2pcs	1-537-824-11	s	CONDUCTIVE BOARD, CONNECTION
2pcs	1-750-659-11	s	CONNECTOR, BNC, FEMALE
1pc	1-810-716-11	s	LCD

[HARNESS, SUB (I/F CABLE)]

1pc	1-955-597-11	o	HARNESS, SUB (I/F CABLE)

This cable includes the following connectors.
CN602 (to TUN-7 board)
CN761 (to CPU-208 board)
- (to CPU-208 board)
- (to D-SUB 15pin)

7-4. Accessories Supplied

Ref. No. or Q'ty	Part No.	SP	Description
2pcs	1-501-612-12	s	ANTENNA
1pcs	3-810-586-12	s	MANUAL, INSTRUCTION (For U model)
	3-810-586-21	s	MANUAL, INSTRUCTION (For AU model)